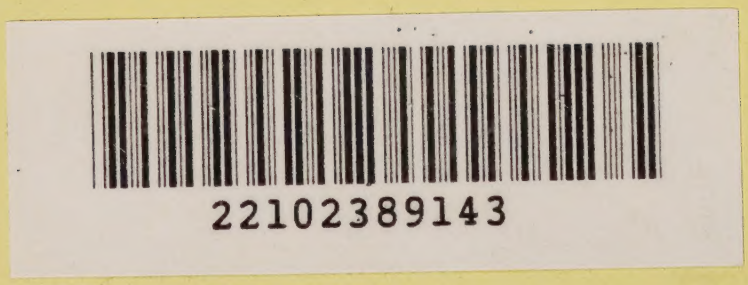
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OF

THE MEDICAL SOCIETY

OF

LONDON.

VOLUME THE NINETEENTH.

EDITED BY

AMAND ROUTH, M.D.,

AND

GEORGE R. TURNER, F.R.C.S.

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1860. John Gay.
1861. Arthur Leared, M.D.
1862. Victor de Méric.
1863. Samuel Osborne Habershon, M.D.
1864. John Louis William Thudichum, M.D.
1865. Robert Greenhalgh, M.D.
1866. Thomas Christopher Weeden Cooke.
1867. Frederick William Headland, M.D.
1868. William Frederick Teevan.
1869. George Duncan Gibb, M.D.
1870. Francis Mason.
1871. William Cholmeley, M.D.
1872. Frederick James Gant.
1873. John Cockle, M.D.
1874. Robert Brudenell Carter.
1875. George Buchanan, M.D.
1876. Erasmus Wilson, F.R.S.
1877. John Hughlings Jackson, M.D., F.R.S.
1878. Alfred Carpenter, M.D.
1879. Walter John Coulson.
1880. William Henry Broadbent, M.D.
1881. Arthur Edward Durham.
1882. Edmund Symes Thompson, M.D.
1883. Edward Lund.
1884. Charles Theodore Williams, M.D.
1885. George Murray Humphry, M.D., F.R.S.
1886. Richard Douglas Powell, M.D.
1887. Sir William MacCormac.
1888. Sir Joseph Fayrer, K.C.S.I., M.D., F.R.S.
1889. Jonathan Hutchinson, F.R.S.
1890. Arthur Ernest Sansom, M.D.
1891. Sir Joseph Lister, Bart., F.R.S.
1892. Sir James Crichton-Browne, M.D., F.R.S.
1893. W. Mitchell Banks.
1894. William M. Ord, M.D.
1895. A. Pearce Gould.
1896. William H. Allchin, M.D.

THE FOTHERGILLIAN GOLD MEDALLISTS.

1787. William Falconer, M.D.
1790. Robert Willan, M.D.
1791. John Coakley Lettsom, M.D.
1795. John Mason Good.
1801. Francis Bouttatz, M.D.
1803. Edward Jenner, M.D.
1824. Robert W. Bampfield.
1828. John George Parry.
1831. William Augustus Guy.
1834. William James Clement.
1835. George Moore.
1836. Thomas Egerton Bryant.
1838. George Pilcher.
1840. Samuel Osborn.
1842. James Risdon Bennett, M.D.
1843. John Weaver Lever, M.D.
1844. Henry Pratt Robarts.
1845. Walter Cooper Dendy.
1846. Robert Mortimer Glover, M.D.
1847. Silas Stedman.
1849. John Milligan.
1850. Richard Payne Cotton, M.D.
1851. Richard Hodges.
1852. Frederick William Headland.
1853. Alfred William Poland.
1854. Benjamin Ward Richardson, M.D.
1856. William Burke Ryan.
1857. Edwin Canton.
1858. Thomas Herbert Barker, M.D.
1859. Alderman Thomas Houghton Waters.
1868. John Clay.
1870. Thos. Smith Clouston, M.D.
1872. Edwards Crisp, M.D.
1873. John Kent Spender, M.D.
1877. Peter Murray Braidwood, M.D.
1878. John Milner Fothergill, M.D.
1882. Thomas Michael Dolan, M.D.
1883. Norman Porritt.
1886. John Strahan.
1888. Hobart Amory Hare, M.D., U.S.A.
1893.* William Richard Gowers, M.D., F.R.S.
1896. Victor Horsley, F.R.S.

* *First Triennial Award under the Charity Commissioners' New Scheme*, vide *Trans., vol. xiv, p. xi.*

THE HONORARY FELLOWS.

1893. Barnes, Robert, M.D., Lingwood, Liss, Hants, LL, C.

1876. Barnes, J. K., M.D., Surgeon-General U.S. Army, Washington.

1896. Berger, Paul, Professor of Clinical Surgery in the Faculty of Medicine, Member of the Academy of Medicine, Surgeon to "l'hôpital de la Pitié," Paris.

1881. Billings, John S., M.D., Washington, Surgeon to the United States Army; Librarian to the Surgeon-General's Library, Washington.

1894. Catrin, Louis, M.D., Médecin-major de première classe, Professeur agrégé à l'Ecole du Val-de-Grace, Paris.

1873. Chauveau, A., Professor of Physiology at the Medical School of Lyons.

1890. Crudeli, Tommasi, M.D., Rome.

1881. Da Costa, J. M., M.D., Professor of Medicine in the Jeffreson Medical College, 1700, Walnut-street, Philadelphia.

1881. Emmet, Thomas Addis, M.D., 89, Madison-avenue, Surgeon to the Woman's Hospital of the State of New York.

1886. Gairdner, William Tennant, M.D., LL.D. Edin., F.R.C.P. Edin., F.R.S., 225, St. Vincent-street, Glasgow.

1894. Gant, Frederick James, F.R.C.S., 16, Connaught-square, W., Consulting Surgeon to the Royal Free Hospital. P, VP 2, LL, O, C 3.

1881. Halla, Joseph, Professor of Medicine in the University of Prague.

1869. Hare, Charles John, M.D., Berkeley House, Manchester-square, W., Consulting Physician to University College Hospital, and late Professor of Clinical Medicine in University College. P, VP 2. C 8, LL. *Trustee.*

1896. Hicks, John Braxton, M.D., F.R.S., The Brackens, Lymington, Hants, Consulting Obstetric Physician, Guy's Hospital and St. Mary's Hospital. C.

1890. Holmgren, Frithiof, Professor, Upsala.

1875. Jenner, Sir William, Bart., K.C.B., D.C.L., LL.D., M.D., F.R.S., Greenwood, Durley, Hants, Physician-in-Ordinary to H.M. the Queen and to H.R.H. the Prince of Wales; late President of the Royal College of Physicians; Emeritus Professor of Clinical Medicine in University College, London; Consulting Physician to University College Hospital.

1890. Kocher, Theodor, Professor, Berne.

1883. Le Roy de Mericourt, A., M.D., Paris.

1890. Lombard, Henri-Clermond, M.D., Geneva.
1878. Mitchell, S. Weir, M.D., Walnut-street, Philadelphia.
1881. Nussbaum, John Nepomuk Ritter von, M.D., Professor of Surgery in the University of Munich.
1875. Ollier, Professor, Lyons.
1873. Paget, Sir James, Bart., D.C.L., LL.D., F.R.S., 5, Park-square, W., Serjeant-Surgeon to H.M. the Queen; Surgeon to H.R.H. the Prince of Wales; Consulting Surgeon to St. Bartholomew's Hospital.
1876. Pancoast, Joseph, M.D., 1030, Chesnut-street, Philadelphia, Professor of Anatomy in the Jeffreson Medical College.
1877. Sanné, A., 12, Place de Laborde, Paris.
1881. Tarnier, Stephanie, M.D., Professor of Obstetric Medicine in the School of Medicine, Paris.
1873. Virchow, Rudolph, M.D., Professor of Pathological Anatomy in the University of Berlin.

CORRESPONDING FELLOWS.

1851. Albaro, J. Mendez, Madrid.
1882. Badaloni, Giuseppe, M.D., Fano, Prov. di Pesaro, Italy.
1856. Baker, Albert, M.D., Clarence House, Exmouth.
1855. Beardsley, Amos, Bay Villa, Grange, Lancashire.
1850. Benavente, Mariano, Madrid.
Beneke, F. W., M.D., New York.
1850. Böhm, Professor, M.D., Vienna.
Bottini, Giuseppe, M.D., Milan.
1837. Buhring, J. J., M.D., Berlin.
1855. Coates, Charles, M.D., F.R.C.P., 10, Circus, Bath, Consulting Physician to the Bath Royal United Hospital. c 3.
1850. Cox, William Isidore, Hawkesbury-Upton, Gloucestershire. c.
1876. De Muynck, J., M.D., Ghent.
1836. Ecstein, Sigismund, M.D., Vienna.
Eylandt, Johann Emil, M.D., Curland, Russia.
1853. Fallot, R., M.D., St. Laurent d'Aigonze, Montpelier, France.
1889. Frank, Philip, M.D., F.R.C.P., Cannes, France.
1876. Griffith, Richard Glyn, Allahabad, India.
1896. Hamilton, Allan McLane, M.D., 44, East Twenty-ninth Street, New York.
1864. Hasenfeld, Emmanuel, M.D., Pesth.
Hyman, —, M.D., Antwerp.
1851. Izguierdo, Sebastian Obtega, Madrid.
1875. Jones, Philip Sydney, M.D., F.R.C.S., Examiner in Medicine in the University of Sydney, Australia, Hon. Consulting Surgeon to the Sydney Infirmary.
1861. Journez, Henri, M.D., 43, Rue de la Charité, Bruxelles, Belgique.
1851. Kölliker, Albert, M.D., Professor of Anatomy and Physiology at the University of Wurzburg.
1876. Leighton, Walter H., M.D., Lowell, Massachusetts, U.S.A.
Leon, Jose, Madrid.
1851. Llanos, Antonio Campo, Madrid.
1851. Lovera, Jose, Madrid.
1851. Marino, Bonifacio Matreos, Madrid.
Mendez, Bartholome, Madrid.
Molina, M. M. Madrid.

1851. Negri, Gaetano, M.D. Pisa.
Ortega, J. R., Madrid.
1865. Peruzzi, Domenico, M.D., 22, Via Mazzini, Bologna.
1882. Restrepo, Alessando Eduardo, M.D., Medillin, Columbia, U.S.A.
1886. Rocha, A., M.D., Coimbra, Beira, Portugal.
1860. Roussel, M.D., Dean of the Faculty of Medicine, Montpelier.
Scharlan, Gus. W., M.D., Stettin, Prussia.
1876. Schmitz, Richard, M.D., Neuenahr.
1874. Schutgowsky, J., St. Petersburg.
1851. Sesse, M., Mesqui, Madrid.
Stockwell, Thomas Goldesbrough, F.R.C.S., 6, Circus, Bath, Surgeon to the Bath Royal United Hospital.
Tereza, Felix Garcia, Madrid.
Valdez, Franco Cortigo, Madrid.
Williams, Charles, F.R.C.S. Edin., 48, Prince of Wales-road, Norwich; Senior Surgeon to the Norfolk and Norwich Hospital.

THE FELLOWS

OF

THE MEDICAL SOCIETY OF LONDON.

(Corrected to 1st October, 1896.)

Explanation of Abbreviations.

P.—President.	FM.—Fothergillian Gold Medallist.
VP.—Vice-President.	SM.—Silver Medallist.
T.—Treasurer.	O.—Orator.
L.—Librarian.	CFC.—Chairman, House and Finance Committee.
S.—Secretary.	§—Sec. for Foreign Correspondence.
C.—Councillor.	*—Life Members.
LL.—Lettsomian Lecturer.	Tr.—Trustee.

The number prefixed signifies the date of election. The figures appended indicate the number of Sessions served, and refer to past appointments ONLY.

1890. Abbot-Anderson, William Maurice, M.B., 10, Old Cavendish-street, Cavendish-square, W.

1888. Abbott, Charles Edward, M.R.C.S., Shrapnels, Taunton.

1891. Abraham, Phineas S., M.D., 2, Henrietta-street, Cavendish-square, W.

1894. Achard, Alexander Louis, M.D., 9, Blandford-street, Portman-square, W.

1890. Ackland, Robert Craig, M.R.C.S., 13, Savile-row, W.

1883. Acland, Theodore Dyke, M.D., 74, Brook-street, Grosvenor-square, W. C.

1884. Adam, James, M.D., Malling-place, West Malling, Kent.

1889. Adams, James, M.D., 4, Chiswick-place, Eastbourne.

1878. Adams, Josiah Oake, M.D., Brook House, Upper Clapton, E.

1852. *Adams, William, F.R.C.S., 101, Gloucester-place, W. P, C 8, O, VP 3, LL.

1878. *Allchin, William Henry, M.D., F.R.S.E., 5, Chandos-street Cavendish-square, W. VP 2, O., *Hon. Librarian.*

1873. Allen, Henry Marcus, F.R.C.P. Edin., 20, Regency-square, Brighton.

1873. Allfrey, Charles Henry, M.D., Plas Newydd, St. Leonards-on-Sea.
1883. Allingham, Herbert W., F.R.C.S., 25, Grosvenor-street, W. c 3.
1872. *Allingham, William, F.R.C.S., 25, Grosvenor-street, W. c.
1894. Alston, William Evelyn, M.B., Wheathampstead, Herts.
1860. Althaus, Julius, M.D., 48, Harley-street, W. c 5, § 3.
1885. Anderson, John, M.D., C.I.E., 9, Harley-street, W. *Councillor.*
1889. Anderson, William, F.R.C.S., 2, Harley-street, W. c.
1888. Andrewes, Frederick William, M.B., 35, Welbeck-street, W.
1869. Armitage, Samuel Harris Tatham, M.D., 39, Grosvenor-street, W.
1894. Armstrong, William, M.R.C.S., Thorncliffe, Buxton.
1894. Ashe, William Percy, M.D., 23, Cadogan-gardens, S.W.
1873. Atkinson, Edward, M.R.C.S., 93, Albion-street, Leeds.
1892. Ayres, Charles James, M.D., 55a, Welbeck-street, W.

1873. Bagshawe, Frederic, M.D., 35, Warrior-square, St. Leonards-on-Sea. c.
1871. Bailey, George Hewlett, M.R.C.S., 43, Queen Anne-street, W.
1892. Bailey, Henry Frederick, M.R.C.S., The Hollies, Lee-terrace, Lee, S.E. c 2.
1894. Bailey, Robert Cozens, M.S., 21, Welbeck-street, W.
1891. Baily, Percy J., M.B., County Asylum, Hanwell, W.
1876. *Baker, Henry Francis, F.R.C.S. Edin., 2, Mandeville-place, Manchester-square, W. c.
1890. Baker, William Henry, M.R.C.S., 152, Westbourne-grove, W.
1891. Ball, James Barry, M.D., 12, Upper Wimpole-street, W.
1881. Ballance, Charles Alfred, M.S., 106, Harley-street, W. s 2, c 3.
1884. Banks, W. Mitchell, F.R.C.S., 28, Rodney-street, Liverpool. o, c.
1859. Barnes, John Wickham, F.R.C.S., 104, Stamford-street, S.E. s 2, vp, c 3.
1883. *Barnes, Robert, M.D., *Honorary Fellow* (*q. v.*).
1895. Barratt, John Oglethorpe Wakelin, M.D., 26, Upper Wimpole-street, W.
1874. Barrett, Howard, M.R.C.S., 49, Gordon-square, W.C. c 2. *Councillor.*
1896. Barrett, Walter Russell, M.R.C.S., 6, Chandos-street, Cavendish-square, W.
1884. Barrow, Albert Boyce, F.R.C.S., 37, Wimpole-street, W. c.
1886. Barwell, Richard, F.R.C.S., 55, Wimpole-street, W.
1884. Bateman, Frederick Augustus Newton, M.R.C.S., 4, Charles-street, St. James's-street, S.W.
1886. Batterham, John Williams, M.B., Bank House, Grand-parade, St. Leonards-on-Sea.
1888. Battle, William Henry, F.R.C.S., 2, Mansfield-street, W. *Councillor.*
1896. Bayliss, Richard Arthur, M.R.C.S., Spondon, Derbyshire.
1882. Beach, Fletcher, M.B., Winchester House, Kingston-hill, Surrey, and 64, Welbeck-street, W. c.
1887. Beale, Edwin Clifford, M.B., 23, Upper Berkeley-street, W.
1891. Beale, Peyton T. B., F.R.C.S., 61, Grosvenor-street, W.

1880. Beevor, Charles Edward, M.D., 33, Harley-street, W. s 2, c. *Trustee.*

1889. Beevor, Sir Hugh Reeve, Bart., M.D., 18, Serjeants'-inn, Fleet-street, E.C.

1887. Benham, Frederick Lucas, M.D., 93, Elizabeth-street, Eaton-square, S.W. *Councillor.*

1881. Bennet, Robert Ottiwell-Gifford, M.D., Tankerville House, Park-place, Buxton.

1883. Bennett, William Henry, F.R.C.S., 1, Chesterfield-street, Mayfair, W. c.

1887. Berry, James, F.R.C.S., 60, Welbeck-street, W.

1873. Beveridge, James Spowart, M.R.C.P. Edin., Lochinver, Lairg, N.B.

1890. Bidwell, Leonard Arthur, F.R.C.S., 59, Wimpole-street, W.

1868. Bird, George, M.D., 6, Windmill-hill, Hampstead, N.W.

1888. Bird, Matthew Mitchell, M.D., St. Mary's Hospital, W.

1850. *Birkett, John, F.R.C.S., 1, Sussex-gardens, W. vp, c 6.

1895. Bishop, Edward Stanmore, F.R.C.S., 316, Oxford-road, Manchester.

1883. Biss, Cecil Yates, M.D., 135, Harley-street, W.

1889. Bisshopp, Francis Robert Bryant, M.B., Belvedere, Lonsdale-gardens, Tunbridge Wells.

1886. *Black, William Gall, F.R.C.S., 2, George-square, Edinburgh.

1881. Blaker, Walter Campbell, Bognor, Sussex.

1888. Blanc, Leon, M.D., Aix les Bains, France.

1871. *Bloxam, John Astley, F.R.C.S., 75, Grosvenor-street, W. vp 2, s 2, c 3.

1867. Bond, Thomas, F.R.C.S., 7, The Sanctuary, Westminster, S.W. c.

1879. Bott, Henry, M.R.C.S., Brentford, Middlesex.

1886. Bourns, Newcome Whitelaw, M.D., 78, Redcliffe-gardens, S.W.

1886. Boustead, Robinson, M.D., Surgeon Lieutenant-Colonel, c/o Messrs. King & Co., 45, Pall Mall, S.W.

1895. Bower, David, M.D., Springfield House, Bedford.

1889. Bowles, Robert Leamon, M.D., 16, Upper Brook-street, W. *Councillor.*

1895. Boyd, Stanley, F.R.C.S., 134, Harley-street, W.

1896. Bradley, James Edward Campbell, M.B., Greville House, Raynes Park, Wimbledon.

1883. Bradshaw, James Dixon, M.B., Savile Club, Piccadilly.

1868. Braidwood, Peter Murray, M.D., Coleshill, Amersham, Bucks. f.m., 1877.

1869. Braine, Francis Woodhouse, F.R.C.S., 67, Wimpole-street, W. vp 2, s 2, c 3, sm.

1889. Braine, C. Carter, F.R.C.S., 67, Wimpole-street, W.

1876. Brewer, Alexander Hampton, M.R.C.S., 136, Richmond-road, Dalston, E.

1896. Bridges, Ernest C., M.B., 100, Ridgmount-gardens, W.C.

1873. Bridgwater, Thomas, M.B., LL.D., J.P., Harrow, Middlesex.

1893. Broadbent, John Francis Harpin, M.B., 35, Seymour-street, W.
1862. Broadbent, Sir William Henry, Bart., M.D., 84, Brook-street, W. P, VP, O, LL, C 4.
1890. Brook, William Frederick, F.R.C.S., Langlands House, Swansea.
1878. Brown, Andrew, M.D., Elton Villa, 1, Bartholomew-road, Kentish Town, N.W.
1889. Browne, George Buckston, M.R.C.S., 80, Wimpole-street, W. C 2.
1873. Browne, Lennox, F.R.C.S. Edin., 15, Mansfield-street, Portland Place, W.
1887. Bruce, John Mitchell, M.D., 23, Harley-street, W. C. *Councillor.*
1873. Brunjes, Martin, M.R.C.S., 33A, Gloucester-place, Bryanston-square, W.
1862. Brunton, John, M.D., 16, Endsleigh-street, Tavistock-square, W.C. VP, C 2.
1874. *Brunton, Thomas Lauder, M.D., F.R.S., 10, Stratford-place, W. LL, VP, C 4, SM.
1850. *Bryant, Thomas, F.R.C.S., 65, Grosvenor-street, W. P, VP, LL, S 2, C 4. *Trustee.*
1885. *Bunny, J. Brice, M.R.C.S., Warre House, Bishop's Lidyeard, Taunton.
1890. Butler, Patrick, L.K.Q.C.P., Chiddingfold, Godalming, Surrey.
1886. Butler-Smythe, Albert Charles, F.R.C.S., 76, Brook-street, W.
1872. Byas, Edward Hegley, M.R.C.S., 10, Cambridge-gate, Regent's Park, N.W.

1886. Cahill, John, F.R.C.S., 12, Seville-street, Lowndes-square, Hyde Park, S.W. C 3.
1892. Caldwell, Robert, F.R.C.S., Surgeon Captain, care of Messrs. Holt and Co., 17, Whitehall-place, S.W.
1893. Caley, Henry Albert, M.D., 24, Upper Berkeley-street, W.
1891. Calvert, James, M.D., 36, Queen Anne-street, W.
1888. Campbell, Charles M., M.D., *Travelling.*
1892. Cargill, Lionel Vernon, F.R.C.S., 15, Stratford-place, W.
1892. Carless, Albert, F.R.C.S., 10, Welbeck-street, W.
1889. Carnall, Edward, M.R.C.S., Small-pox Hospital, Highgate, N.
1882. Carpenter, Arthur Bristowe, M.B., Wykeham House, Bedford Park, Croydon.
1889. Carr, John Walter, M.D., 19, Cavendish-place, W.
1871. Carter, Robert Brudenell, F.R.C.S., 31, Harley-street, W. P, VP, O, LL, C 4.
1889. Cartwright, Alexander, M.R.C.S., 32, Old Burlington-street, W.
1876. Cartwright, S. Hamilton, 45, Albert-gate, Hyde-park, W.
1876. *Cathcart, Samuel, M.R.C.P. Edin., Prudhoe House, High-road, Tottenham, E.
1889. Cautley, Edmund, M.D., 15, Upper Brook-street, W.
1882. Cavafy, John, M.D., 2, Upper Berkeley-street, W. C 3.

1891. Chaplin, T. H. Arnold, M.B., 24, Finsbury-circus, E.C.
1896. Chapman, Charles William, M.D., 21, Weymouth-street, W.
1885. Chasseaud, William, M.D., Smyrna, Asia Minor.
1889. Cheyne, Watson, F.R.C.S., F.R.S., 75, Harley-street, W. ll, c.
1877. *Chisholm, Edwin, M.D., Sydney, New South Wales.
1895. Christmas, Robert William Samuel, M.R.C.S., 23, Speenham-road, Stockwell, S.W.
1871. Churton, Thomas, M.D., 35, Park-square, Leeds. c.
1875. Clark, Andrew, F.R.C.S., 71, Harley-street, W. c.
1883. Clarke, William Bruce, F.R.C.S., 51, Harley-street, W. c.
1894. Clinch, Thomas Aldous, M.B., 4, Ridgmount-gardens, W.C.
1879. *Clutton, Henry Hugh, F.R.C.S., 2, Portland-place, W. vp 2, c 2. *Councillor.*
1894. Cochrane, James Mackeand, M.D., 10, Weymouth-street, W.
1849. *Cockle, John, M.D., The Lodge, West Molesey, Surrey. p, vp, o, l 3, c 3, sm.
1893. Cole, Robert Henry, M.D., Moorcroft, Hillingdon, Uxbridge.
1887. Collier, William, M.D., St. Mary's Entry, Oxford. c.
1892. Colman, Walter S., M.D., 22, Wimpole-street, W.
1871. Cook, John, M.D., 1, Nottingham-terrace, Regent's Park, N.W.
1862. Cooper, Alfred, F.R.C.S., 9, Henrietta-street, Cavendish-square, W. c 3, vp.
1888. Cooper, Arthur, 20, Old Burlington-street, W.
1894. Cooper, Peter, M.R.C.S., 35, Shooters-hill-road, Blackheath, S.E.
1894. Corbould, Victor A. L. E., M.R.C.S., 50, Victoria-road, Kensington, W.
1872. Corfield, William Henry, M.D., 19, Savile-row, W. c.
1892. Cotterell, Edward, F.R.C.S., 5, West Halkin-street, Belgrave-square, S.W.
1891. Coumbe, John Batten, M.D., "Rosslyn," Clevedon, Somerset.
1879. Coupland, Sidney, M.D., 16, Queen Anne-street, W. vp 2, c 2. *Councillor.*
1889. Courtney, Guy Budd, M.B., 28, Augusta-road, Ramsgate.
1874. Craigie, John Hamilton, 13, Savile-row, W. c.
1873. Craven, Sir Robert Martin, F.R.C.S., J.P., 14, Albion-street, Hull.
1889. Crawford, James, M.D., Grosvenor-mansions, 80, Victoria-street, S.W.
1871. Crichton-Browne, Sir James, M.D., F.R.S., 61, Carlisle-mansions, S.W. p, o, c. *Councillor.*
1881. Cripps, William Harrison, F.R.C.S., 2, Stratford-place, W. c 2.
1880. Critchett, George Anderson, F.R.C.S. Edin., 21, Harley-street, W.
1880. Crocker, Henry Radcliffe, M.D., 121, Harley-street. c 3.
1881. Cross, Francis Richardson, F.R.C.S., Worcester House, Clifton, Bristol.
1890. Cullingworth, Charles James, M.D., 14, Manchester-square, W. c 3.
1874. Cumberbatch, Alphonso Elkin, F.R.C.S., 80, Portland-place, W. c 2.

1892. Da Costa, Francis Xavier, F.R.C.S., Bombay, India.
1894. Dalby, John Lyttleton, M.R.C.S., 4, Freeland-road, Ealing.
1871. Dalby, Sir William Bartlett, F.R.C.S., 18, Savile-row, W. P, C 2.
1864. Dale, George Cornelius, M.D., 13, Nightingale Park-crescent, Wandsworth Common, S.W.
1881. Dallaway, Dennis Joseph William, L.R.C.P. Edin., The Knoll, Kingston-hill, Surrey.
1885. Davies-Colley, John Neville Colley, F.R.C.S., 36, Harley-street, W. C 3.
1890. Davis, Henry, M.R.C.S., 60, Queen Anne-street, W.
1889. *Davison, James, M.D., "Streate Place," Bath-road, Bournemouth.
1880. Davson, Smith Houston, M.D., Campden Villa, 203, Maida-vale, W. C 3.
1868. *Davy, Richard, F.R.C.S., F.R.S.E., Burstone House, Bow, North Devon. VP, S 2, SM, § 2.
1876. Dawes, Richard St. Mark, M.R.C.S., Gawler, South Australia.
1880. Dawson, Yelverton, M.D., Heathland, Southborne-on-Sea, Christchurch, Hants.
1894. Dean, Henry Percy, M.S., 84, Wimpole-street, W.
1883. Dent, Clinton Thomas, F.R.C.S., 61, Brook-street, Grosvenor-square, W. C 3.
1891. Diver, Ebenezer, M.D., Yately House, Kenley, Surrey.
1893. Dockrell, Morgan, M.D., 9, Cavendish-square, W.
1885. Dodd, Henry Work, F.R.C.S., 136, Harley-street, W.
1882. Dolan, Thomas Michael, M.D., Horton House, Halifax. FM 1882.
1881. Doran, Alban Henry Griffiths, F.R.C.S., 9, Granville-place, W. C 3. *Hon. Sec. Foreign Correspondence.*
1890. Douglas, William, M.D., Dalkeith House, 7, Clarendon-place, Leamington Spa.
1871. Dowse, Thomas Stretch, M.D., 14, Welbeck-street, W. § 3, C 3.
1877. Drew, John Henry, M.R.C.S., 38, Eastbourne-terrace, Hyde Park, W. C 6.
1881. Drewitt, Frederic George Dawtrey, M.D., 2, Manchester-square, W.
1886. Duckworth, Sir Dyce, M.D., 11, Grafton-street, Piccadilly, W. *Councillor.*
1848. *Duncan, James, M.B., 8, Henrietta-street, Covent Garden, W.C.
1884. Duncan, William, M.D., 6, Harley-street, W.
1884. Durham, Frederick, F.R.C.S., 82, Brook-street, W.

1895. Ealand, Hugh Fawsit, L.R.C.P. Edin., Puckeridge, Herts.
1891. Eastes, Thomas, M.D., 3, Shakespeare-terrace, Folkestone.
1893. Eccles, Arthur Symons, M.B., 23, Hertford-street, Mayfair, W.
1895. Eccles, William McAdam, M.S., 124, Harley-street, W.
1892. Eddowes, Alfred, M.D., 25, Old Burlington-street, W.
1860. Edmunds, James, M.D., 29, Dover-street, W.
1880. Edwards, Frederick Swinford, F.R.C.S., 55, Harley-street, W. C 3.
1868. Elliott, George Frederick, M.D., 1, Albion-street, Hull.

1882. Elliott, Thomas, M.D., Monson-place, Tunbridge Wells.
1889. Embleton, Dennis Cawood, M.R.C.S., St. Wilfrid's, St. Michael's-road, Bournemouth.
1883. Emond, E., M.D., 113, Boulevard Beaumarchais, Paris.
1883. English, Edgar, M.R.C.S., 1, Thorne-road, Doncaster.
1880. English, Thomas Johnston, M.D., 128, Fulham-road, S.W.
1889. Esler, Robert, M.D., 4, Queen's-road, Peckham, S.E.
1891. Euan-Smith, Euan McLaurin, M.R.C.S., 253, Cromwell-road, S.W.
1894. Evans, Willmott Henderson, F.R.C.S., 13, Taviton-street, Gordon-square, W.C.
1883. Ewart, Sir Joseph, M.D., J.P., Retired Dep. Surgeon-General, Bengal Army, Montpellier Hall, Brighton. c.
1877. Ewart, William, M.D., 33, Curzon-street, Mayfair, W. c.

1889. Fairbank, Frederick Royston, M.D., 16, Eversfield-place, St. Leonards-on-Sea.
1884. Fardon, Edward Ashby, M.R.C.S., Middlesex Hospital, W.
1873. Fayrer, Sir Joseph, Bart., K.C.S.I., LL.D., M.D., F.R.S., 16, Devonshire-street, Portland-place, W. p, vp, ll, sm, o, c.
1896. Fayrer, Joseph, M.D., Surgeon-Captain, Royal Horse Guards (Blue).
1884. Fenton, Frederick Enos, F.R.C.S., 33, Welbeck-street, W.
1888. Fenwick, Bedford, M.D., 20, Upper Wimpole-street, W.
1885. Fenwick, Edwin Hurry, F.R.C.S., 14, Savile-row, W. c.
1887. Ferrier, David, M.D. Edin., F.R.S., 34, Cavendish-square, W. c.
1878. Field, George, M.R.C.S., 34, Wimpole-street, W. c.
1894. Fisher, Frederick Charles, F.R.C.S., King's Langley, Herts.
1876. Fisher, Frederic Richard, F.R.C.S., 17, Wimpole-street, W.
1894. Fleming, Samuel, M.B., Cranley-gardens, Highgate, N.
1884. Flint, Arthur, M.D., J.P., Westgate Lodge, Westgate-on-Sea.
1878. *Fonmartin, Henry de, M.D., 26, Newberry-terrace, Lower Bullar-street, Southampton.
1893. Forbes, Norman Hay, F.R.C.S., Edin., Montpelier Lodge, Tunbridge Wells.
1884. Fotherby, Henry Arthur, 17, Scarsdale-terrace, Cheniston-gardens, Kensington, W.
1879. Fowler, James Kingston, M.D., 35, Clarges-street, Mayfair, W. s 2, c.
1873. Fox, Arthur Edward Wellington, M.B., C.M., 16, Gay-street, Bath. c.
1887. Fox, Fortescue, M.D., Strathpeffer Spa, Ross-shire.
1871. Fox, Francis, M.R.C.S., 68, Wimpole-street, W. c 3.
1885. Fox, R. Hingston, M.D., 23, Finsbury-square, E.C.
1879. Fox, Thomas Colcott, M.B., 14, Harley-street, W. s 2. c 2.
1868. Freer, Alfred, J.P., Stourbridge, Worcestershire.
1896. Freyer, P. Johnston, M. Ch., Surgeon-Lieut.-Colonel (*retired*), 46, Harley-street, W.

1886. Frith, Baptist Gamble, M.B., 29, Cornwallis-gardens, Hastings.
1884. Frost, William Adams, F.R.C.S., 17, Queen Anne-street, W. c 2.
1894. Fyffe, William Kington, M.B., 19, Duke-street, Manchester-square, W.

1883. Gabbett, Henry Singer, M.D., 8, Chiswick-place, Eastbourne.
1895. Galloway, James, M.D., 21, Queen Anne-street, W.
1862. *Gant, Frederick James, F.R.C.S., *Honorary Fellow* (*q. v.*).
1847. *Garrod, Sir Alfred Baring, M.D., F.R.S., 10, Harley-street, W. p, vp 2, ll, o, c 9.
1887. Garrod, Archibald Edward, M.D., 9, Chandos-street, Cavendish-square, W. c 3.
1893. Garson, John George, M.D., 64, Harley-street, W.
1891. Gaster, Aughel, M.D., 224, Belsize-road, N.W.
1887. Gay, John, 119, Upper Richmond-road, Putney, S.W.
1879. Gibbes, Heneage, M.D., The University, Michigan, U.S.A.
1856. *Gibbon, Septimus, M.B., 39, Oxford-terrace, W.
1882. Gibbons, Robert Alexander, M.D., 29, Cadogan-place, S.W.
1893. Gibson, Charles, M.D., Vanderbilt-court, Harrogate.
1881. Giffard, Douglas W., M.R.C.S., 5, Pavilion-parade, Brighton.
1867. Gill, William, M.R.C.S., 11, Russell-square, W.C. c.
1894. Gill, Richard, F.R.C.S., 72, Wimpole-street, W.
1869. Godson, Clement, M.D., 9, Grosvenor-street, W. vp, c 3, s 2, sm.
1873. Goodsall, David Henry, F.R.C.S., 17, Devonshire-place, Portland-place, W. vp 2. c, s 2, sm, cfc 7. *Treasurer; Chairman, House and Finance Committee.*
1892. Gordon, Robert John, M.B., Kwangchengtaii Newchwang, North China.
1878. *Gould, Alfred Pearce, M.S., 10, Queen Anne-street, W. s 2, c 3, o. *Vice-President.*
1876. Gowers, William Richard, M.D., F.R.S., 50, Queen Anne-street, W. vp, c, sm, ll. fm. 1893.
1887. Grant, James Edward Roney, M.R.C.S., 2, Charing Cross-chambers, Duke-street, Adelphi, W.C.
1896. Grant, J. Dundas, M.D., 8, Upper Wimpole-street, W.
1881. Green, Thomas Henry, M.D., 74, Wimpole-street, W. c 2. vp.
1886. Greves, Edwin Hyla, M.D., Rodney House, Bournemouth.
1873. Grieve, the Hon. Robert, M.D., C.M.G., British Guiana.
1875. Griffith, G. de Gorrequer, M.R.C.S., 34, St. George's-square, S.W.
1885. Griffiths, Charles Thomas, L.R.C.P., 125, Soho-hill, Birmingham.
1884. Griffiths, Herbert Tyrrell, M.B., 5, Kensington-square, W.
1880. Gristock, William, M.D. Lond., 6, Finchley-road, N.W.
1893. Gubb, Alfred Samuel, M.D. Paris, 29, Gower-street, W.C.
1891. Guthrie, Leonard G., M.D., 15, Upper Berkeley-street, W.

1886. Habershon, S. Herbert, M.D., 70, Brook-street, Grosvenor-square, W.
1891. Hadley, Wilfred J., M.B., 11, Wimpole-street, W.
1887. Haig, Alexander, M.B., 7, Brook-street, W.
1884. Hairsine, Hudson, Roose House, Upper Tooting, S.W.
1881. Hall, Charles Ross, M.R.C.S., Hatfield, Herts.
1874. *Hall, Francis de Havilland, M.D., 47, Wimpole-street, W. vp 2. c 6, s 2, sm. *Councillor. Lettsomian Lecturer.*
1881. Hames, George Henry, F.R.C.S., 29, Hertford-street, Mayfair, W.
1879. Hamilton, Seton Guthrie, Surgeon-Captain.
1891. Handfield-Jones, Montagu, M.D., 35, Cavendish-square, W.
1850. *Hare, Charles John, M.D., *Honorary Fellow* (*q. v.*). *Trustee.*
1888. Hare, Hobart Amory, 222, South Fifteenth-street, Philadelphia. fm. 1888.
1891. Harold, John Patrick, M.R.C.S., 91, Harley-street, W.
1882. Harper, Gerald Samuel, M.B., 40, Curzon-street, Mayfair, W. c.
1895. Harrison, Charles James, M.D., Rossetti - mansions, Chelsea, S.W.
1871. Harrison, Reginald, F.R.C.S., 6, Lower Berkeley-street, Portman-square. vp 2, ll, c 1. *President.*
1883. *Hartridge, Gustavus, F.R.C.S., 12, Wimpole-street, W.
1882. Harvey, John Stephenson Selwyn, M.D., 1, Astwood-road, Crom-well-road, S.W.
1882. Haslam, William Frederick, F.R.C.S., 24, York-road, Edgbaston, Birmingham. c 3.
1852. *Haward, Edwin, M.D., 34a, Gloucester-place, W.
1883. Hawken, Charles St. Aubyn, Wadeford, Chard, Somerset.
1889. Hawkins, Francis Henry, M.B., 26, Portland-place, Reading.
1890. Hebb, Frederick Theodore, M.R.C.S., 98, Oakley-street, Chelsea-embankment, S.W.
1891. Hensman, Frank, M.R.C.S., Surgeon-Major.
1883. Herman, George Ernest, M.B., 20, Harley-street, W.
1879. Heron, George Allan, M.D., 57, Harley-street, Cavendish-square, W. c 3.
1883. Herschell, George A., M.D., 27, Queen Anne-street, W.
1883. Hewitt, Frederick William, M.D., 10, George-street, Hanover-square, W. c.
1876. Heycock, Francis Raworth, C.M., 26, Upper Wimpole-street, W.
1872. *Hicks, John Braxton, M.D., F.R.S., *Honorary Fellow* (*q. v.*) c.
1895. Hill, Ernest, M.R.C.S., Western Hospital, Fulham, S.W.
1892. Hill, William, M.D., 28, Weymouth-street, W.
1873. Hobson, William Henry, M.R.C.S., Great Berkhamstead, Herts.
1895. Hodgson, George Goodfellow, M.R.C.S., Devonshire House, Bootle, Liverpool.
1879. Hogg, Arthur John, M.R.C.S., Leslie Lodge, Haven-green, Ealing, W.
1892. Hogg, Frederick Stapleton D., M.R.C.S., The Limes, Tillingham, Essex.

1884. Holland, Charles Edward, M.B., "Airdrie," The Avenue, Kew Gardens, Surrey.
1888. Holm, John, F.R.C.S. Edin., 13, Stratford-place, W.
1868. Holman, Constantine, M.D., 26, Gloucester-place, Portman-square, W. c 4. *Vice-President.*
1881. Hood, Donald William Charles, M.D., 43, Green-street, W. c 2.
1893. Horrocks, Herbert, M.D., Consumption Hospital, Brompton, S.W.
1896. Horsley, Victor, F.R.C.S., F.R.S., 25, Cavendish-square, W. F.M., 1896.
1883. *Hovell, T. Mark, F.R.C.S. Edin., 105, Harley-street, W.
1886. Huddart, Cuthbert Henry Cooke, M.B., Shoyswell Manor, Etchingham, Sussex.
1885. Hudson, Charles Elliott Leopold Barton, F.R.C.S., 16, Harley-street, W.
1890. Hughes, Edgar, F.R.C.S., 91, Onslow-gardens, South Kensington, S.W.
1864. Hume, Frederick Henry, M.D., 53, Devonshire-street, Islington, N.
1884. Hunter, Sir Guyer, M.D.
1889. Hunter, William, M.D., 54, Harley-street, W.
1881. Hutchinson, Jonathan, F.R.C.S., F.R.S., 15, Cavendish-square. P, LL, c 5, o.
1892. Hutchinson, Jonathan, Jun., F.R.C.S., 1, Park-crescent, Portland-place, W.
1875. Hutchinson, Samuel John, M.R.C.S., 64, Brook-street, W.
1895. Hyde, Samuel, M.D., Lismore House, Buxton, Derbyshire.

1889. I'Anson, William Andrew, Denton Hall, Newcastle-on-Tyne.
1891. Isaac, George Washington, M.B., 75, Gower-street, W.C.

1884. *Jackson, Frederick William, M.D., Yorkgate House, Broadstairs.
1868. Jackson, John Hughlings, M.D., F.R.S., 3, Manchester-square, W. P, VP, O, C 5.
1874. Jagielski, Victor Apollinaris, M.D., 54, York-terrace, Regent's Park, N.W.
1887. Jamison, Arthur Andrew, M.D., 18, Lowndes-street, Belgrave-square, S.W.
1884. Jennings, Charles Egerton, M.D., 48, Seymour-street, W.
1886. Jervis, Arthur, M.B., 52, York-street, Portman-square, W.
1883. Jessop, Walter Hamilton, F.R.C.S., 73, Harley-street, W.
1893. Johnston, George Francis, M.D., 6, Manchester-square, W.
1886. Johnston, James, M.D., 53, Prince's-square, Bayswater, W.
1893. Joll, Boyd Burnett, M.B., 21, Great Russell-mansions, British Museum, W.C.
1888. Jones, Arthur Henry, M.D., 45, Sheep-street, Northampton.
1893. Jones, Henry Lewis, M.D., 9, Upper Wimpole-street, W.
1890. Jones, H. Macnaughton, M.D., 141, Harley-street, Cavendish-square, W.

1888. Jones, John Talfourd, M.B., Rosebank, South-terrace, Eastbourne, Sussex.
1892. *Jones, Robert, F.R.C.S., 11, Nelson-street, Liverpool.
1896. Jones, Robert, M.D., Claybury Asylum, Woodford Bridge, Essex.
1881. Jones, Thomas William Carmalt, F.R.C.S. Edin., 6, Westbourne-street, Hyde Park, W.
1893. Joule, John Samuel, M.D., 32, Maida-hill West, W.
1877. Juler, Henry Edward, F.R.C.S., 23, Cavendish-square, W. *Councillor.*

1889. Kauffmann, Otto Jackson, M.D., 22, Broad-street, Birmingham.
1891. Keegan, Denis Francis, M.D., Brigade Surgeon-Lieutenant-Colonel, East India United Service Club, St. James's-square, S.W.
1884. Keetley, Charles Bell, F.R.C.S., 56, Grosvenor-street, W. c 3.
1892. Keiffenheim-Trubridge, Luigi W. A., M.D., The Hoo, Rochester.
1847. *Kellock, William Berry, M.D., 94, Stamford-hill, N.
1891. Kelson, William Henry, M.D., 46, Watling-street, E.C.
1890. Ker, Hugh Richard, F.R.C.S. Edin., Tintern, 2, Balham Hill, S.W.
1884. Kerr, Norman, M.D., 1, Hamilton-terrace, Regent's Park, N.W. c. *Councillor.*
1881. Keser, Jean Samuel, M.D., 11, Harley-street, W. c 2, § 3.
1876. Key, Augustus Cooper, M.D., 30, Wilton-place, S.W. c 2.
1886. Kidd, Percy, M.D., 60, Brook-street, W. c 2.
1895. King, Arthur, M.B., Belmont, Station-road, Watford, Herts.
1889. Kirkham, Frederick William, Downham Market, Norfolk.
1883. Knapton, George, Craven House, Moss-lane, Manchester.
1875. Knox, John, M.D., Bethnal Green Infirmary, E.

1889. Lake, Richard, F.R.C.S., 19, Harley-street, W.
1868. Lake, William Charles, M.D., Teignmouth, Devon.
1895. Lane, James Ernest, F.R.C.S., 46, Queen Anne-street, W.
1881. Langton, John, F.R.C.S., 62, Harley-street, W. c 2.
1882. Larkin, F. Colet, M.B., *Travelling.*
1890. Law, Edward, M.D. Edin., 35, Harley-street, W.
1890. Lawrie, Edward, M.B. Edin., Surgeon-Lieutenant-Colonel, Bengal Army, The Residency, Hyderabad.
1858. Lawson, George, F.R.C.S., 12, Harley-street, W. vp 2, c 3.
1893. Lee, E. Samuel, M.D., 31, Pevensey-road, St. Leonards-on-Sea.
1887. Leggatt, Charles Ashley Scott, M.D., 2, Walton-place, S.W.
1894. Lendon, Edwin Harding, M.B. (Oxon.), 162, Holland Park Avenue, W.
1886. Lewers, Arthur Hamilton Nicholson, M.D. Lond., 72, Harley-street, W.
1895. Lewis, Ernest Wool, M.R.C.S., 12, King-street, Hammersmith, W.
1867. Lichtenberg, George, M.D., 47, Finsbury-square. c 2.
1893. Light, Edwin Mellor, M.B., 2, Wilton-place, S.W.

1878. Lister, Sir Joseph, Bart., D.C.L., LL.D., F.R.C.S., President of the Royal Society, 12, Park-crescent, Portland-place. o.

1890. Lithgow, Robert Alexander Douglas, M.D., LL.D., 27a, Lowndes-street, S.W.

1889. Little, Ernest Muirhead, F.R.C.S., 40, Seymour-street, Portman-square, W.

1889. Little, Fletcher, M.D., 32, Harley-street, W.

1878. Lockwood, Charles Barrett, F.R.C.S., 19, Upper Berkeley-street, W. c, s 2. *Vice-President.*

1873. Loe, James Scarborough, 26, Woodhouse-lane, Leeds.

1881. Lorimer, G., M.D., 9, Terrace-road, Buxton, Derbyshire.

1868. Lowe, John, M.D., J.P., 4, Gloucester-place, Portman-square, W. c 3.

1868. *Lund, Edward, F.R.C.S., 22, St. John's-street, Manchester. o, c 3.

1889. Lunn, Henry Simpson, M.D., 5, Endsleigh-gardens, N.W.

1889. Lush, Percy, M.B., 4, Maresfield-gardens, Hampstead, N.W.

1884. MacBryan, Henry Crawford, Kingsdown House, Box, Wilts.

1894. McCann, Frederick John, M.B., 5, Curzon-street, Mayfair, W.

1885. McConnel, Henry Wilson, M.B., Great Ryburgh, Fakenham, Norfolk.

1871. MacCormac, Sir William, F.R.C.S., 13, Harley-street, W., President of the Royal College of Surgeons. p, vp, § 2, c 4, o.

1885. MacGeagh, Thomas Edwin Foster, M.D., 23, New Cavendish-street, W.

1896. MacGregor, Patrick Fraser, M.B., 24, Addison-gardens, W.

1873. McHardy, Malcolm Macdonald, F.R.C.S. Edin., 5, Savile-row, W.

1882. MacKellar, Alexander Oberlin, F.R.C.S., 79, Wimpole-street, W.

1894. Mackenzie, Hector William Gavin, M.D., 59, Welbeck-street, W.

1880. Mackenzie, Stephen, M.D., 18, Cavendish-square, W. vp 2, c 4, ll.

1881. Maclagan, Thomas John, M.D., 9, Cadogan-place, S.W. c 3.

1861. MacLaren, Alexander Connell, 60, Harley-street, W.

1891. Maclean, Allan, 10, Mitre-court Chambers, Temple, E.C.

1887. Macready, Jonathan Foster Christian Horace, F.R.C.S., 51, Queen Anne-street, W. *Councillor.*

1883. Maddick, Edmund Distin, F.R.C.S. Edin., 2, Chandos-street, Cavendish-square, W.

1885. Maguire, Robert, M.D., 4, Seymour-street, W. c 2. *Hon. Secretary.*

1890. Malcolm, John David, F.R.C.S. Edin., 13, Portman-street, Portman-square, W.

1893. Malcolm, William A., M.B., Oak House, 421, Holloway-road, N.

1887. Mantle, Alfred, M.D., Savile-place, Halifax.

1888. Mapother, Edward Dillon, M.D., 32, Cavendish-square, W. c 3.

1891. Marsh, Howard, F.R.C.S., 30, Bruton-street, W.

1892. Marshall, Arthur Lumsden, M.B., 56, Rectory-road, N.

1873. Marshall, Edward, M.R.C.S., Church House, Mitcham, Surrey.

1869. Marshall, William, M.D., Torricburn, Barnes, S.W. c.

1864. Marshall, William Gurslave, F.R.C.S., 72, Bromfelde-road, Clapham, S.W.
1889. Martin, John Michael Harding, M.D., Arnheim, Blackburn, Lancashire.
1890. Martin, Sidney, M.D., F.R.S., 10, Mansfield-street, W.
1893. Mason, George Armstrong, M.B., 45, George-street, Portman-square, W.
1884. Matheson, Farquhar, M.B., 11, Soho-square, W.
1891. Maude, Arthur, M.R.C.S., Winterton House, Westerham, Kent.
1892. May, Chichester Gould, M.D., 26, Walton-street, Pont-street, S.W.
1891. May, William Page, M.D., 34, Welbeck-street, W.
1884. Meredith, William Appleton, C.M., 21, Manchester-square, W. c.
1864. Middlemist, Robert Percy, M.R.C.S., 6, Devonport-street, Hyde Park, W. c 4.
1895. Monier-Williams, Montagu Sneade Faithfull, M.R.C.S., 54, Onslow-gardens, S.W.
1883. Moore, Thomas, F.R.C.S., 6, Lee-terrace, Blackheath, S.E.
1883. Morgan, John Hammond, F.R.C.S., 68, Grosvenor-street, W. s 2, c.
1893. Morison, Alexander, M.D., 14, Upper Berkeley-street, W.
1871. Morley, Alexander, 42, Albemarle-street, W.
1895. Morley, Frank, M.R.C.S., 42, Albemarle-street, W.
1881. Morris, Henry, F.R.C.S., 8, Cavendish-square, W. c.
1878. Morris, Malcolm Alexander, F.R.C.S. Edin., 8, Harley-street, W. c 2.
1882. Morton, Andrew Stanford, F.R.C.S., 133, Harley-street, W.
1884. *Moullin, Charles William Mansell, F.R.C.S., 69, Wimpole-street, W.
1893. Murphy, George Wyndham, M.B., J.P., 228, Gloucester-terrace, Hyde Park, W.
1886. Murphy, James, M.D., Holly House, Sunderland.
1894. Murray, Charles Stormont, L.R.C.S. Edin., 85, Gloucester-place, W.
1884. Murray, Fred., M.B., Durbanville, Cape Colony, South Africa.
1890. Murray, George, M.R.C.S., 34, Wimpole-street, Cavendish-square, W.
1886. Murray, Hubert Montague, M.D., 27, Savile-row, W. c 3.
1879. Murrell, William, M.D., 17, Welbeck-street, W.

1893. Napier, Alexander Disney Leith, M.D., 67, Grosvenor-street, W.
1894. Naumann, J. C. Francis, M.D., 125, Gower-street, W.C.
1877. Nesbitt, Dawson, M.D., 1, Norfolk-square, Hyde Park, W.
1876. Newham, James, 80, Gloucester-place, W.
1889. *Nias, J. Baldwin, M.D., 5, Rosary-gardens, South Kensington, S.W.
1880. Nix, Edward James, M.D., 11, Weymouth-street, W. c. 2. *Councillor.*

1887. Oakley, Adam Robert Hamilton, L.R.C.P., Treath, Hornchurch, Essex.
1894. O'Callaghan, Robert, F.R.C.S.I., 137, Harley-street, W.

1885. Ogilvie, Leslie, M.B., 46, Welbeck-street, W.
1884. Ogle, Charles John, 1, Cavendish-place, W.
1884. Oliver, George, M.D., West End Park, Harrogate.
1892. Openshaw, Thomas Horrocks, F.R.C.S., 16, Wimpole-street, W.
1875. Ord, William Miller, M.D., 37, Upper Brook-street, W. P, O, C 4.
1892. Ord, William Wallis, M.D., 2, Queen-street, Mayfair, W.
1887. Ormerod, Joseph Arderne, M.D., 25, Upper Wimpole-street, W. C.
1889. Orton, George Hunt, M.B., 1A, Campden Hill-road, Kensington, W.
1884. Orwin, Arthur Wigelsworth, M.D., 15, Weymouth-street, Portland-place, W.
1894. Osborn, Samuel, F.R.C.S., J.P., Maisonnette, Datchet, near Windsor.
1880. Oswald, James Waddell Jeffreys, M.D., 245, Kennington-road, S.E. C. *Councillor.*
1883. Owen, Charles J. Rayley, 14, Devonshire-terrace, Hyde Park, W.
1878. *Owen, Edmund, F.R.C.S., 64, Great Cumberland-place, W. VP 2, C 3, S 2, SM, LL. *Trustee. Orator.*
1881. Owen, Isambard, M.D., 40, Curzon-street, Mayfair, W. S 2, C 4.

1886. Paget, Stephen, F.R.C.S., 57, Wimpole-street, W. C 2.
1880. Palmer, Frederick Stephen, M.D., Compton Lodge, East Sheen, S.W.
1882. Palmer, William Pitt, M.B., 17, Belgrave-terrace, Torquay.
1877. *Paramore, Richard, M.D., 2, Gordon-square, W.C.
1881. Parrott, Edward John, M.R.C.S., The Thorn, Hayes, Middlesex.
1871. Parsons, Francis Henry, M.D., "The Hurst," West Worthing.
1885. Pasteur, William, M.D., 4, Chandos-street, Cavendish-square, W. S 2, C. 2.
1872. Patten, Charles Arthur, M.R.C.S., Marpool House, Ealing, W.
1891. Patterson, Charles Sumner, M.B., 40, Highbury-place, N.
1890. Pattison, Edward Seton, M.R.C.S., Granville House, Fulham-park, S.W.
1861. Paul, John Hayball, M.D., Camberwell House, Camberwell, S.E. C 6.
1854. *Pavy, Frederick William, M.D., F.R.S., 35, Grosvenor-street, W. VP, LL, C.
1881. *Peacey, William, M.D., 11, Breakspears-road, Brockley, S.E.
1883. Peck, Edward George, M.A., Queensbury, Bradford, Yorks.
1871. Pedler, George Henry, M.R.C.S., 6, Trevor-terrace, Knightsbridge, S.W.
1883. Perigal, Arthur, M.D., New Barnet, Herts.
1878. Philipps, Sutherland Rees, M.D., St. Ann's Heath, Virginia Water, Berks.
1894. Phillipps, William Alfred, M.D., 13, John-street, Berkeley-square, W.
1876. Phillips, Charles Douglas Ferguson, M.D., F.R.S.E., 10, Henrietta-street, Cavendish-square, W. C 3.
1873. Phillips, George Richard Turner, M.R.C.S., 24, Palace-court, Bayswater-hill, W. C 2.

1885. Phillips, John, M.D., 71, Grosvenor-street, W.
1883. Phillips, Sidney Philip, M.D. Lond., 62, Upper Berkeley-street, Portman-square, W.
1883. Pick, Thomas Pickering, F.R.C.S., 18, Portman-street, W. c 2.
1884. Piesse, C. H., M.R.C.S., 2, New Bond-street, W.
1883. Pitts, Bernard, F.R.C.S., 109, Harley-street, Cavendish-square. c 5, s 2.
1890. Pope, Harry Campbell, M.D. Lond., 280, Goldhawk-road, Shepherd's Bush, W.
1873. Port, Heinrich, M.D., 48, Finsbury-square, E.C. § 3. *Councillor.*
1871. Powell, Richard Douglas, M.D., 62, Wimpole-street, W. p, vp, c 5, o.
1891. Powell, William Wyndham, F.R.C.S., 16, Old Burlington-street, W.
1891. Preston, Theodore Julian, M.R.C.S., Fleet Surgeon, Royal Navy, 238, Portsdown-road, Maida Vale, W.
1891. *Prickett, Marmaduke, M.D., 27, Oxford-square, W.
1885. Pringle, John James, M.B., 23, Lower Seymour-street, W.
1889. Pritchard, Owen, M.D., 41, Gloucester-square, W.
1873. Purcell, Ferdinand Albert, M.D., 7, Manchester-square, W.

1870. Quain, Sir Richard, Bart., M.D., F.R.S., 67, Harley-street, W. vp, c 3.

1892. Ramsay, James, M.D., High Peter-gate, York.
1861. Ramskill, Jabez Spence, M.D., 5, St. Helen's-place, E.C.
1894. Rankin, Guthrie, M.D., 4, Chesham-street, Belgravia, S.W.
1881. Ranking, John Ebenezer, M.D., Hanover House, Tunbridge Wells.
1894. Rayner, Herbert Edward, F.R.C.S., Harcourt House, Camberley, Surrey.
1859. *Rayner, John, M.D., Swaledale House, Highbury-quadrant, N.
1879. Reeves, Henry Albert, F.R.C.S. Edin., 7, Grosvenor-street, W.
1890. Reid, John, M.B., Clanmurray, Dromore, co. Down.
1882. Reid, Thomas Whitehead, M.D., 34, St. George's-place, Canterbury.
1887. Remfry, Leonard, M.D., 60, Great Cumberland-place, Hyde Park, W.
1872. Richards, Joseph Peeke, M.R.C.S., 6, Freeland-road, Ealing, W. c 3.
1850. *Richardson, Sir Benjamin Ward, M.D., LL.D., F.R.S., 25, Manchester-square, W. p, vp, ll, c 5, o, fm 1854.
1868. *Roberts, David Lloyd, M.D., F.R.S.E., 11, St. John's-street, Manchester.
1857. *Roberts, David Watkin, M.D., 56, Manchester-street, W.
1885. Roberts, Edward Coleridge, M.R.C.S., Southgate, N.
1874. Roberts, Frederick Thomas, M.D., 102, Harley-street, W. vp 2 ll, c.
1889. Roberts, Sir William, M.D., F.R.S., 8, Manchester-square, W. c.

1873. Robertson, William Henry, M.D., J.P., 6, The Square, Buxton, Derbyshire.
1884. Robinson, Arthur Henry, M.D., The Infirmary, Bancroft-road, N.E.
1847. *Rogers, William Richard, M.D., 26, Upper Baker-street, N.W. vp, c 6.
1890. Root, Arthur Guernsey, M.D., 46, Eagle-street, Albany, New York, U.S.A.
1886. Rose, Robert Duncan, F.R.C.S., St. Leonard's-place, York.
1874. Rose, William, F.R.C.S., 17, Harley-street. c 2, ll, vp 2.
1883. *Ross, Daniel McClure, M.D., Cedar Lodge, Littledown-road, Bournemouth.
1888. *Roth, Bernard, F.R.C.S., J.P., 29, Queen Anne-street, W.
1893. Roughton, Walter, F.R.C.S., Cranborne House, New Barnet, Herts.
1876. Routh, Alfred Curtis, 33, Marina, St. Leonards-on-Sea.
1881. *Routh, Amand, M.D., 14a, Manchester-square, W. c 2, s. 2. *Councillor.*
1848. *Routh, Charles Henry Felix, M.D., 52, Montagu-square, W. p, vp 2, o, ll, s 4, c 6, sm. *Trustee.*
1891. Ruffer, Marc Armand, M.D., Medical School, Cairo, Egypt.
1887. Rushworth, Frank, M.D., "Langdale," Goldhurst-terrace, South Hampstead, N.W.
1889. Russell, James Samuel Risien, M.B., 4, Queen Anne-street, W.
1886. Rutherfoord, Henry Trotter, M.D., Salisbury House, Taunton.

1887. Sainsbury, Harrington, M.D., 63, Welbeck-street, W.
1863. *Sansom, Arthur Ernest, M.D., 84, Harley-street, W. vp, s 2, c 5, sm, §, ll, o.
1895. Sansom, Charles Lane, F.R.C.S. Edin., 8, Wilton-street, Grosvenor-place, S.W.
1886. Savage, George Henry, M.D., 3, Henrietta-street, W. c.
1886. Savill, Thomas Dixon, M.D., 60, Upper Berkeley-street, W.
1873. Sedgwick, James, M.D., Boroughbridge, Yorkshire.
1868. Sedgwick, Leonard William, M.D., 48, Gloucester-terrace, Hyde Park, W. vp 2, c 4, § 3.
1883. Semon, Felix, M.D., 39, Wimpole-street, W. §, c.
1887. Servais, Leopold, M.D., Antwerp, Belgium.
1889. Shaw, George, M.B., 1, The Drive, West Brighton.
1884. Shaw, John, M.D., Burlington House, Willoughby-road, Hampstead, N.W.
1886. Sheild, Arthur Marmaduke, F.R.C.S., 4, Cavendish-place, W. c 2, s 2.
1890. Sheppard, William John, M.D., 211, Upper Richmond-road, Putney, S.W.
1881. Shipton, Arthur, F.R.C.S. Edin., Buxton, Derbyshire.
1885. Shoemaker, John V., M.D., 1031, Walnut-street, Philadelphia, U.S.A.

1894. Shuttleworth, George Edward, M.D., Ancaster House, Richmond, Surrey.
1890. Silk, John Frederick William, M.D., 29, Weymouth-street, W.
1884. Simpson, James Herbert, M.D., The Crescent, Rugby, Warwickshire.
1884. Sinclair, John, M.R.C.P., General Post Office, St. Martin's-le-Grand, E.C.
1891. Sisley, Richard, M.D., *Travelling.*
1883. *Skerritt, Edward Markham, M.D., Richmond Hill, Clifton.
1886. Slater, Charles, M.B., 16, Northwick-terrace, St. John's Wood, N.W.
1862. Slight, George, M.D., 14, Old Burlington-street, W. c 2.
1889. Smale, Morton, M.R.C.S., 22a, Cavendish-square, W.
1845. *Smiles, William, M.D., St. Martha's Lodge, Guildford. vp 2, s 4, c 9, sm.
1896. Smith, E. Stanley, M.D., 10, Kensington Gardens-square, W.
1887. Smith, Frederick John, M.D., 4, Christopher-street, Finsbury-square, E.C.
1882. Smith, Herbert Urmson, Oudtshoorn, Cape of Good Hope, South Africa.
1873. Smith, Heywood, M.D., 18, Harley-street, W. c 3.
1880. Smith, Noble, F.R.C.S. Edin., 24, Queen Anne-street, W.
1891. Smith, Solomon Charles, M.D., 1, Montagu Mansions, Montagu-square, W.
1877. Smith, Sydney Lloyd, M.R.C.S., 25, Argyle-square, King's Cross, W.C.
1882. Smith, Thomas Frederick Hugh, F.R.C.S., Farningham, Kent.
1873. *Smith, Thomas Gilbart, M.D., 68, Harley-street, W. vp 2, s 2, sm, c 4. *Trustee.*
1872. Smith, Walter, M.R.C.P. Edin., Orleans House, 60, Regent's Park-road, N.W.
1874. Smyth, William Woods, Maidstone.
1894. Snape, Ernest Alfred, M.D., 41, Welbeck-street, W.
1894. Snow, Herbert, M.D., 6, Gloucester-place, W.
1893. Spencer, Herbert Ritchie, M.D., 10, Mansfield-street, W.
1888. Spencer, John, Lyons-terrace, Hetton, Durham.
1887. Spicer, Scanes, M.D., 28, Welbeck-street, W.
1883. Spitta, Edmund Johnson, M.R.C.S., Ivy House, Clapham Common, S.W.
1864. Squire, Alexander John Balmanno, M.B., 24, Weymouth-street, Portland-place.
1881. Startin, James, M.R.C.S., 15, Harley-street, W.
1892. Staveley, William H. C., F.R.C.S., 13, South Eaton-place, S.W.
1896. Steele-Perkins, George Chapman, M.B., 85, Wimpole-street, W.
1884. Stephens, William John, 9, Old Steyne, Brighton.
1892. Stewart, Hastings, M.R.C.S., 13a, Charles-street, St. James's, S.W.
1882. Stewart, James, F.R.C.P. Edin., Dunmurry, Sneyd-park, near Clifton.

1894. Stewart, Kenneth Trevor, M.D., 29, Dover-street, Berkeley-square, W.
1883. Stewart, William Robert Henry, F.R.C.S. Edin., 42, Devonshire-street, Portland-place, W.
1884. Stiven, Edward Winnan Fleming, M.D., Lincoln House, Harrow, Middlesex.
1885. Stivens, B. H. Lyne, M.D., 107, Park-street, Grosvenor-square, W.
1848. *Stocker, John Sherwood, M.D., 2, Montagu-square, W. c 10, s 2.
1884. Stoker, George, M.R.C.S., J.P., 14, Hertford-street, Mayfair, W.
1892. Stonham, Charles, F.R.C.S., 4, Harley-street, W.
1877. Stowers, James Herbert, M.D., 41, Finsbury-square, E.C.
1873. Strange, William Heath, M.D., 5, Grosvenor-street, W. c 3.
1881. Sturge, William Allen, M.D., Maison Malausséna, Boulevard Dubouchage 29, Nice. sm.
1889. Sumpter, Walter John Ernely, M.R.C.S., Sheringham, Norfolk.
1892. Sunderland, Septimus, M.D., 35, Bruton-street, W.
1876. *Sutherland, Henry, M.D., 6, Richmond-terrace, Whitehall, S.W.
1892. Sutton, J. Bland, F.R.C.S., 48, Queen Anne-street, W.
1892. Swift, William John Cropley, M.R.C.S., 4, Gordon-square, W.C.
1885. *Syers, Henry Walter, M.D. Camb., 4, Oxford and Cambridge Mansions, Hyde Park, W.
1884. Symonds, Horatio Percy, F.R.C.S., 35, Beaumont-street, Oxford.
1893. Symonds, Charters James, F.R.C.S., 26, Weymouth-street, W.

1864. Tait, Edward Wilmshurst, M.R.C.S., 48, Highbury-park, N.
1879. *Tait, Lawson, F.R.C.S., 7, The Crescent, Birmingham.
1875. Tamplin, Charles Harris, M.R.C.S., 17, Paragon, Ramsgate.
1882. Taylor, Seymour, M.D., 16, Seymour-street, Portman-square, W. c 2.
1859. Thompson, Edmund Symes, M.D., 33, Cavendish-square, W. vp, o, s 3, c 3, sm.
1855. *Thompson, Sir Henry, F.R.C.S., 35, Wimpole-street, W. vp., ll., c 4.
1896. Thompson, Henry George, M.D., 86, Lower Addiscombe-road, Croydon, Surrey.
1895. Thompson, James Andrew Baird, M.D., White Hall, Abridge, Essex.
1873. Thomson, John Roberts, M.D., Monkchester, Bournemouth, Hants.
1894. Thomson, St. Clair, M.D., 28, Queen Anne-street, W.
1892. Thornton, George, M.D., Fountain Hospital, Lower Tooting, S.W.
1876. Thornton, John Knowsley, M.C., J.P., 49, Montagu-square, W. p, vp, c 3.
1867. Thorowgood, John Charles, M.D., 61, Welbeck-street, W. ll, s 2, s.m, c 3, vp 2. *Vice-President.*
1856. *Thudichum, John Louis William, M.D., 11, Pembroke-gardens, Kensington, W. vp, ll, o, c.
1884. Thursfield, Thomas William, M.D., J.P., Selwood, Beauchamp-square, Leamington.

1865. Travers, William, M.D., 2, Phillimore-gardens, Kensington, W.
1884. *Treves, Frederick, F.R.C.S., 6, Wimpole-street, W. c 3, ll, vr 2.
1882. Tuke, Charles Molesworth, Chiswick House, Chiswick.
1886. Tuke, Thomas Seymour, M.B. Oxon., Chiswick House, Chiswick.
1884. Turner, George R., F.R.C.S., 49, Green-street, Grosvenor-square, W. c 2. *Honorary Secretary.*
1890. Tweed, Edward Reginald, M.D., 55, Upper Brook-street, W.
1883. Tweedy, John, F.R.C.S., 100, Harley-street, W. c.
1891. Tyson, William Joseph, M.D., 10, Langhorne-gardens, Folkestone.

1887. *Underwood, Edward T., M.D., Fort Bombay, India.

1883. Venning, Edgcombe, F.R.C.S., 30, Cadogan-place, S.W.
1874. Verley, Reginald Louis, F.R.C.P. Edin., St. George's Club, Hanover-square, W.
1893. Voelcker, Arthur Francis, M.D., 31, Harley-street, W.

1892. Waggett, Ernest Blechynden, M.B., 66, Park-street, Grosvenor-square, W.
1850. *Waggett, John, M.D., Perivale, Bournemouth; and Union Club, S.W.
1884. Wakley, Thomas, 5, Queen's-gate, S.W.
1850. *Wakley, Thomas Henry, F.R.C.S., 5, Queen's-gate, S.W.
1894. Wallis, Frederick Charles, F.R.C.S., 26, Welbeck-street, W.
1880. Walsham, William Johnson, F.R.C.S., 77, Harley-street, W. c.
1895. Walters, Frederick R., M.D., 60, Welbeck-street, W.
1894. Waring, Holburt Jacob, F.R.C.S., 9, Upper Wimpole-street, W.
1881. Warner, Francis, M.D., 5, Prince of Wales-terrace, W.
1894. Waterhouse, Herbert Furnivall, F.R.C.S., 81, Wimpole-street, W.
1883. Waterhouse, William Dakin, LL.D., 18, Woodchurch-road, West Hampstead, N.W.
1891. Watson, W. Spencer, F.R.C.S., 7, Henrietta-street, Cavendish-square, W.
1889. Waugh, Henry Dunn, M.D., 6, Sumner-place, Onslow-square, S.W.
1884. Webb, F. Ernest, M.R.C.S., 113, Maida-vale, W.
1896. Weber, Frederick Parkes, M.D., 19, Harley-street, W.
1889. Weber, Hermann, M.D., 10, Grosvenor-street, W.
1887. Webster, Henry William, M.D., St. George's Infirmary, Fulham-road, S.W.
1838. *Wells, John Robinson, F.R.C.S., 4, Pierrepoint-road, Acton, W. c 2.
1884. West, Samuel, M.D., 15, Wimpole-street, W. s 2, c 4, cfc.
1889. Wethered, Frank Joseph, M.D., 83, Harley-street, W.

1892. Wheaton, Samuel Walton, M.D., 52, The Chase, Clapham Common, S.W.
1882. Whipham, Thomas T., M.D., 11, Grosvenor-street, W. sm, c.
1884. Whistler, William MacNeill, M.D., 17, Wimpole-street, W.
1889. White, E. F., F.R.C.S., Westlands, 280, Upper Richmond-road, Putney, S.W.
1868. White, Joseph, F.R.C.S. Edin., 6, Southwell Gardens, Queen's Gate, S.W. c. *Councillor.*
1880. *White, William Henry, M.D., 43, Weymouth-street, W. c. 3.
1885. White-Cooper, George Owen, M.B., 5, Courtfield-road, S.W.
1883. Whitehead, Walter, F.R.C.S. Edin., F.R.S.E., 499, Oxford-road, Manchester. c.
1885. Whitla, William, M.D., 8, College-square North, Belfast, Ireland.
1877. Whitmore, William Tickle, F.R.C.S. Edin., 7, Arlington-street, Piccadilly, W.
1872. Williams, Charles Theodore, M.D., 2, Upper Brook-street, Grosvenor-square, W. p, vp 2, ll, s 2, sm, o, l 3, c 9.
1876. Williams, Henry William, M.D., Hillside, Guilsborough, Northampton.
1883. Williams, Sir John, Bart., M.D., 63, Brook-street. c 3.
1883. Willis, Arthur Keith, M.A. Oxon., Gascony House, West End-lane, N.W. *Councillor.*
1881. Wills, Caleb Shera, C.B., Brigade Surgeon, Lunecliffe, Lancaster.
1873. Wills, Thomas Munns, F.R.C.S.I., J.P., 44, Merton-road, Bootle, Liverpool.
1893. Wills, William Alfred, M.D., 29, Lower Seymour-street, W.
1892. Wilson, Claude, M.D., Belmont, Tunbridge Wells.
1884. Winslow, H. Forbes, M.D., 14, York-place, Portman-square, W.
1873. Winslow, Lyttleton Stewart Forbes, M.B., D.C.L., 33, Devonshire-street, W. c.
1876. Woakes, Edward, M.D., 78, Harley-street, W.
1886. Wood, T. Outterson, M.D., 40, Margaret-street, Cavendish-square, W. c 3.
1873. Woodhouse, Robert Hall, M.R.C.S., 1, Hanover-square, W.
1889. Woolfson de, Louis E. G., 26, St. John's-hill, Shrewsbury.
1891. Woollett, Charles Jerome, F.R.C.S., 35, Telfourd-avenue, Streatham-hill, S.W.
1884. Wyman, William Sanderson, M.D., Red Brae, Putney-hill, S.W. c 2.

1891. Yarr, Michael Thomas, Surgeon-Captain, Medical Staff, 4, Grafton-street, Piccadilly, W.
1884. Yeo, I. Burney, M.D., 44, Hertford-street, Mayfair, W.
1884. Younger, Edward George, M.D., 19, Mecklenburgh-square, W.C.

NON-SUBSCRIBING FELLOWS.

1868. Bateman, Sir Frederic, M.D., J.P., Upper-street, Giles-street, Norwich.
1868. Beatty, Thomas Carlyle, Seaham Harbour, Durham.
1872. Bell, John Hougham, M.D., Ventnor, Isle of Wight.
1868. Buckle, Fleetwood, M.D., Staff Surgeon R.N., Merton Lodge, Southsea.
1868. Child, Edwin, New Malden, Surrey.
1870. Clouston, Thomas Smith, M.D., Royal Asylum, Morningside, Edinburgh. FM 1870.
1868. Fletcher, Thomas Bell Elcock, M.D., J.P., 8, Clarendon-crescent, Leamington.
1868. Folker, William Henry, F.R.C.S., Hanley, Staffordshire.
1869. Foster, Sir Walter B., M.D., M.P., 14, Temple-row, Birmingham.
1868. Fox, Charles Henry, M.D., 32, Rutland-square, Edinburgh.
1868. Gaine, Charles, 30, Gay-street, Bath.
1871. Glynn, Thomas Robinson, M.D., 62, Rodney-street, Liverpool.
1872. Harris, Henry, LL.D., M.D., Redruth, Cornwall.
1868. Knaggs, Samuel, 2, Bradley-lane, Huddersfield.
1869. Lees, Charles Alexander, M.D., Dep. Inspector-General, R.N.
1869. Lipscomb, John Thomas Nicholson, M.D., St. Albans, Herts.
1859. Marshall, James, M.D., Queen's-gate, Aberdeen.
1869. Mathews, Robert, Bickley, Kent.
1871. Maurice, Oliver Calley, 75, London-street, Reading.
1868. McIntyre, John, M.D., LL.D., Odiham, Hants.
1868. Nevins, John Birkbeck, M.D., 3, Abercromby-square, Liverpool.
1871. Ogle, William, M.D., The Elms, Derby.
1869. Pemberton, Oliver, F.R.C.S., J.P., 65, Temple-row, Birmingham.
1869. Philipson, George Hare, D.C.L., M.D., J.P., 7, Eldon-square, Newcastle-on-Tyne.
1869. Price, William Preston, M.D., 1, Ethelbert-crescent, Margate.
1869. Prior, Charles Edward, M.D., 4, Goldington-road, Bedford.
1869. Roberts, Bransby, M.D., Ash Grove, Eastbourne.
1871. Sloman, Samuel George, Farnham.
1869. Stear, Henry, Saffron Walden, Essex.
1869. Taylor, Charles Bell, M.D., 9, Park-row, Nottingham.
1869. Walker, John Swift, M.D., Hanley, Staffs.
1869. Webster, Frederick Richard, St. Albans, Herts.
1868. Wiblin, John, F.R.C.S., Wimborne, Dorset.

*** As it is very desirable that the foregoing Lists should be kept as accurately as possible, Fellows are requested to send notice of any corrections that may be necessary to the Secretaries or to the Registrar.

GENERAL MEETING.

May 11*th*, 1896.

Sir James Crichton-Browne, M.D., F.R.S., President, in the Chair.

Report of the Council, presented at the General Meeting of the Society, May 11*th*, 1896.

The Council begs to submit its Report upon the work of the Session 1895–96.

Smooth working, both in the Meetings of the Society and the Council, has been always manifest, due in great measure to the excellence of the Revised Laws, which are found to stand the proof of actual experience, and the Council wishes to emphasize its grateful thanks to those who devoted so much of their time and thought to the subject.

The change which has made the Sessional and Financial years coincide, has been productive of much simplification, and the convenience of having the same Officers and Council during the entire Session is particularly apparent in the work of the Society.

There has been an increase of five in the number of Fellows, the total now being 774. During the Session 27 Subscribing Fellows have been elected; and Dr. Braxton Hicks has been elected an Honorary Fellow, and Dr. Allan McLane Hamilton, of New York, a Corresponding Fellow.

For various causes eight Fellows have resigned, and six Fellows have been struck off the list for being in arrear with their subscription after due notice had been given, according to Law 17.

Death has been the cause of 12 names being omitted from the List of Fellows. Two of these, Professor Louis Pasteur and Dr. Verneuil, were Honorary Fellows, and the other ten were Subscribing Fellows. Of these Dr. Bristowe will be greatly missed. He was, so late as 1893, Lettsomian Lecturer, and President 1893–94. Another Fellow who had actively taken part in the work of the Society was Mr. A. T. Collum, whose sudden death was deplored by all. The other deaths include the names of Mr. G. Gregson, Dr. R. Read, Dr. W. P. Shipton, Dr. F. A. A. Smith, Dr. G. W. Timms, Mr. J. Waters, Mr. F. B. Betts, and Mr. A. B. Kelly.

The Lettsomian Lectures by Professor Watson Cheyne, F.R.S., on "The Objects and Limits of Operations for Cancer," were of great and general interest, and were unusually well attended.

The Oration, delivered by Mr. Pearce Gould, on "The Recent Evolution of Surgery," was of high merit, and served to still further raise the standard of the Society's Annual Orations.

The Fothergillian Prize was awarded to Professor Victor Horsley, F.R.S., for his published writings and demonstrations on the Thyroid Gland, with special reference to Myxœdema, and he was good enough to give an address on the subject at the request of the Council.

The work of the Session has been, as usual, of much practical value, and the debates have been uniformly good. The Clinical Evenings continue to be particularly well attended. Volume XVIII of the Society's 'Transactions,' containing all communications read during the Session, together with the debates thereon, was issued in due course.

The success of the Annual Dinner, held in March, under the chairmanship of Sir James Crichton-Browne, seems to prove that the second object of the Society's existence, "the cultivation of good-fellowship," is as popular as when the Society was founded in 1773.

A reference to the Report of the House and Finance Committee will show the work which has been completed during the Session, and an inspection of the Society's premises will prove to any one who knows what such structural alterations involve, that Mr. Goodsall, the Chairman of that Committee, has used his great energy and practical experience to the best advantage of the Society. Mr. Goodsall's acceptance of the office of Treasurer has added to the Society's indebtedness to him, and the Council is able to state that the finances of the Society are now on a very sure basis. The Council is glad to congratulate Mr. Goodsall on the success which has rewarded his efforts in both these directions, and to return him its cordial thanks.

The thanks of the Society are also due to the equally real, but perhaps less visible, efforts of the Honorary Librarian, Dr. W. H. Allchin, and the Council desires to express its appreciation of the constant care and attention he gives, so that the Library may retain and increase its great reputation—a reputation which Dr. Allchin has, in past years of service, done so much to build up.

This report of the Council would be incomplete without definite reference being made to the continuous and loyal work given to the Society by the Resident Librarian and Registrar, Mr. Hall. His labours are in a measure unseen, unknown indeed to many of the Fellows, but the officers and Council feel that any success which has furthered their efforts has been in great measure due to the hard work and exact knowledge which Mr. Hall has displayed in the execution of all his duties.

Report of the House and Finance Committee.

The Committee has to report that the whole of the alterations, renewals, and re-decoration of the Society's premises have been completed; that the Meeting Room, Library, and passages have been re-carpeted, and, in addition, that the Meeting Room has been re-seated.

On examining the roof it was found desirable to renew the whole over the Library, and to carry out very extensive repairs to other portions of it.

The cost of these works, together with the architect's charges, has been met by the issue of a further series of Debenture Bonds to the amount of £1,500, making the total amount of outstanding bonds £3,600, all of which are held by Fellows of the Society.

Of this total amount £1,100 must be paid on or before the 31st December, 1899, and the remaining £2,500 between the 1st January, 1900, and the 31st December, 1907.

The Society's premises are now in thoroughly good order and repair, and the cost of maintenance should be very small for many years to come ; but some further expenditure will have to be incurred in providing warming apparatus for the Meeting Room, Library, and the premises generally.

D. H. Goodsall,
Chairman.

Hon. Librarian's Report.

I have the honour to report that the Library continues to be increasingly used by the Fellows of the Society, though scarcely so much as might be expected, which is due, I am inclined to believe, to the fact that volumes may be taken out not being generally known.

The additions made during the past year have been much fewer than usual, only 14 volumes having been purchased, and 32 presented by authors or publishers, making a total of 46.

The opportunity offered by the re-decoration of the Meeting Room was taken advantage of to have the oak book-cases cleaned and re-polished with much improvement to their appearance. The condition in which the Society's rooms were, owing to rebuilding, for upwards of three months, entirely prevented any progress being made with the cataloguing of the old works, which can only be carried out during the vacation. The delay is to be regretted, but was unavoidable. The hope I have annually expressed for some years past, that the Library—the most valuable asset of the Society—might be left undisturbed to permit of its complete arrangement has been again unfulfilled ; but it is satisfactory to add that at the present date no indications for interfering with it this summer are apparent.

I regret to say that the funds of the Society have only permitted a very small amount to be expended on the restoration of some of the older works, and for the first time for several years, I am unable to announce the receipt of any special donation for this purpose

The Library Committee has met for the purchase of books and the transaction of other Library business.

I would desire to claim the special thanks of the Society for Mr. Hall, to whose able assistance, under difficult circumstances, the credit for the efficient state of the Library is chiefly due.

W. H. Allchin, M.D.,
Hon. Librarian.

MEDICAL SOCIETY

DR. BALANCE SHEET, FROM 1ST OCTOBER,

RECEIPTS.

			£	s.	d.
Balance from Last Account			483	11	10
Ordinary—	£	s.	d.		
Subscriptions	566	9	6		
Entrance Fees	26	15	6		
Life Composition Fee	12	12	0		
Rents { Bolt Court (less expenses)	£18	18	8		
Rents { Chandos Street	694	16	9		
	713	15	5		
Contributions for use of Rooms	39	11	0		
Sale of Transactions	0	15	0		
				1,359	18
				£1,843	10 3

FOTHERGILLIAN

	£	s.	d.
Balance from Last Account	86	6	1
One Year's Dividend on £916 10*s.* 5*d.*, $2\frac{3}{4}$ % Consols	25	4	0
	£111	10	1

October 7th, 1896. Examined, compared with vouchers, and

OF LONDON.

1895, TO 30TH SEPTEMBER, 1896. CR.

EXPENDITURE.

	£	s.	d.	£	s.	d.
Ordinary—						
Rent, 11 and 12, Chandos Street (¾ year)	215	0	0			
Rates, Taxes, and Insurance (1 year)	155	10	9			
Salary (¾ year) and Allowances (1 year) of Registrar	86	5	6			
Collector's Poundage on Subscriptions	28	6	0			
Reporter's Salary	22	1	0			
Stationery and Printing	15	2	11			
Printing and issuing 'Trans.,' Vol. xviii	147	10	6			
Library Expenses	11	12	10			
Postage	10	7	4			
Coals and Wood	8	8	0			
Gas and Electric Supply	40	16	10			
Repairs	10	15	11			
Interest on Debentures	125	5	9			
Conversazione	45	0	0			
Refreshments at Meetings	12	12	6			
Band at Anniversary Dinner	8	8	0			
Sundries	1	6	10			
Wages	45	18	0			
Chandlery and Cleaning	15	1	3			
				1,005	9	11
Extraordinary—	£	s.	d.			
Messrs. Clarke and Mannooch, *re* Contract for New Roof to Library, and Re-decoration of Premises	431	12	3			
Medical Society's Architect's Fees (Balance) ..	140	0	0			
Legal Expenses	2	2	0			
Parquet Flooring in Meeting Room	28	6	6			
Carpets	75	7	0			
Chairs for Meeting Room	28	18	0			
Gratuity to Registrar	52	10	0			
				758	15	9
Balance at Bank, 30th September, 1896				79	4	7
				£1,843	10	3

FUND.

	£	s.	d.
Gold Medal and Premium awarded to Professor Victor Horsley, F.R.S.	63	0	0
Books Purchased for Library	13	11	8
Balance at Bank, 30th September, 1896	34	18	5
	£111	10	1

(Signed) D. H. GOODSALL, *Treasurer.*

found correct, (Signed) J. B. NIAS, B. PITTS } *Auditors.*

TRANSACTIONS

OF THE

MEDICAL SOCIETY OF LONDON.

123RD SESSION.

October 14*th*, 1895.

ADDRESS ON "SPECIALISM, MIND AND BODY."

By the President, Sir JAMES CRICHTON-BROWNE, M.D., LL.D., F.R.S.

I SHALL be following a well-worn precedent, and indulging my own feelings, if, on taking possession of this chair for the first time, I gratefully acknowledge your goodness in promoting me to it. Whether I regard the history of this ancient society and the services which for nearly a century and a quarter it has rendered to our profession, or glance at the bead-roll of its Presidential succession studded as that is with worthy and illustrious names, or consider its present constitution and membership, I am convinced that it is no mean honour to be called upon to fill its chief office even for a brief season, and I heartily thank you for having conferred that honour upon me. I owe the distinction, I am aware, less to my personal merits than to your generosity and to the operation of a wise spirit of catholicity which seems at all times to have regulated the procedure of the society. Comprehensive in its aims, broad in its views, and appreciative of the changes which advancing civilisation and accumulating knowledge involve, it has opened its doors to every legitimate phase of professional thought, and has of late years included amongst its Presidents representatives of several of the great specialities into which our profession in its ever-growing heterogeneity tends to divide. Those specialities concerned with the hearing ear and

the seeing eye have been honoured recently in the persons of Sir William Dalby and Mr. Brudenell Carter, and now that one which concentrates its attention upon the thinking mind is recognised by my elevation to this chair.

Now I venture to think that the liberal spirit which characterises the policy of this most conservative of medical societies is one of its admirable features, for by the hospitality it offers to papers on special subjects and by the recognition it bestows on specialist practitioners, while ever basing itself upon the broad general principles of medicine and surgery, it meets one of the wants of the times. It helps thus to prevent that insulation of the specialities which must be full of danger to them scientifically and ethically, and that impoverishment of general professional thought which the withdrawal from its consideration of novel and minute observations in some of the recesses of the temple of healing must entail. It is in vain that we shall inveigh against specialities in these days. The limited compass of the human intellect, and the boundless expansion of scientific knowledge make them inevitable. There can be no admirable Crichtons in medicine or surgery in our times. A few men of rare capacity and industry may attain to exceptional proficiency in several branches of practice; but no man, whatever his powers, can overtake the whole wide and ever-widening fields of professional experience, or train his senses and muscles to consummate expertness in the use of all the now multitudinous instruments of research and treatment. Competent knowledge and skill, equal to every ordinary requirement of professional life, are still, happily, within the reach of all who diligently seek them, although it must be confessed that the strain of acquiring them makes exhaustive demands upon our students; but still, from time to time, there must arise in every practice cases in which insight and dexterity beyond the average are desirable, and in such cases the services of the specialist may be of the highest value. And that their value is justly appreciated by the general practitioners of the country may be inferred from the frequency with which these general practitioners when themselves afflicted by illness seek the advice of specialists. Specialities will henceforth be always with us, and although they can scarcely increase in number, they are likely, I think, to diffuse themselves more widely over the country than they have hitherto done, and to appeal to the masses of the people; and not without advantage,

for specialism is certainly the antithesis of club practice—that universal provider—and the appearance of specialists in provincial towns will perhaps do something to abolish that humiliating exploitation of doctors by benefit clubs and medical aid associations which the struggle for existence in our ranks has rendered possible.

The division of labour is as inevitable in medicine as in manufacture, and instead of resisting or contemning or deploring it, it behoves us to see that it is not carried too far, that it is conducted on rational lines and that the departments of practice detached by it do not become refuges for empirics or imperfectly equipped practitioners, but are outposts occupied by those who have in some respects advanced beyond the ordinary standard of professional qualification. Above all, it behoves us to see that these departments are kept in constant touch and inter-communication with the main body of the profession, and that those who embrace them do not narrow their minds and give up to one organ what was meant for the whole animal economy. Specialism is, I have no doubt, as a rule followed with moderation and a proper sense of proportion, but it must be admitted that it does occasionally tend to mount into monomania or to sink into quackery, and therefore it is that it is so important it should be safeguarded by these wholesome and temperate influences which the free and open atmosphere of our profession as a whole affords.

A certain minimum of literary culture is now required of every one entering the medical profession, and the practitioner who would succeed cannot drop that literary culture behind him when he secures his diploma, but must rather extend and improve it if he would maintain his social position. And so a certain modicum of general professional culture must doubtless be possessed by every practitioner who becomes a specialist, but the specialist who respects his speciality will not allow that modicum to be swallowed up by his particular pursuits, but will be careful to preserve and increase it. This he may do to a large extent in this Medical Society of London. Its discussions range over a wide area, its clinical evenings bring to the surface many interesting and instructive cases, and those who attend its meetings will assuredly be kept well abreast of any advances that are taking place in medicine and surgery. As a specialist myself I can unhesitatingly affirm that I have never attended a meeting here without some edification, and that I have gathered hints helpful in my own

special work from debates on subjects apparently as remote and unpromising as The Importance of the Post Prostatic Pouch in the surgery of vesical calculus, or on Cynobex Hebetis or the Barking Cough of Puberty. A society like this is really in one sense analogous to those evening continuation schools that are now so popular, for it serves an educational purpose, keeps alive an interest in the medical problems of the day, and is a vehicle for the diffusion of new knowledge.

But in another aspect as well as in that of an intellectual arena and mart, this society may, I believe, be useful to specialists. The fine division of professional labour which is going on seems to be sometimes conducive not only to special skill and knowledge, but to special animosity, which can only be counteracted by free and friendly intercourse with all sorts and conditions of professional brethren; intercourse such as this society affords. It is one of its primary canons that within its borders good fellowship shall prevail; and those who are acquainted with its annals will attest that it has, in large measure, succeeded in living up to this rule of discipline, and has by a benign inoculation of *esprit de corps*, and of that attenuated virus of controversy which is produced in an animated but well-ordered and friendly debate, conferred on most of its members immunity from those emotional zymotics which do so easily beset them, and which vex and embitter professional life. At a time when steam navigation was less general than it is now, it was a common observation that the passengers, cooped up together in a ship during a long voyage, developed amongst themselves an extraordinary amount of envy, hatred, malice, and all uncharitableness. The opposing cabals that were at first formed soon broke up into contending atoms; and ultimately no two individuals were on speaking terms with each other, and feuds existed so rancorous that it seemed as if they could only be wiped out in blood. But the moment that land came in sight a marvellous change occurred. Ill-feeling vanished, anger was appeased, quarrels were patched up, sworn enemies fell affectionately upon each other's necks, and good humour reigned supreme. Now it occurs to me that a somewhat analogous state of matters exists among those who are cooped up together in the small craft of a speciality. I do not suggest that with them feeling rises to as acute a pitch as in the case of the ocean voyagers, but I do maintain that they are peculiarly apt to arrange themselves in

cliques, to harbour jealousy, to indulge in detraction, and to treat paltry differences of opinions as if they were grave moral delinquencies. But amongst soured or exasperated specialists, if such there be, a happy change of mood must, I am sure, be effected whenever they heave in sight of the London Medical Society, with its wider interests and more varied associations. Malignity must then evaporate, every grudge be forgotten, and a spirit of tolerance declare itself. The society was the cradle of all the specialities before they could walk by themselves, and now that they strut so bravely abroad it offers them an escape from the somewhat overweening egotism that is apt to characterise youthful independence.

I would plead then with specialists of all types and varieties to avail themselves of the advantages which the society offers. Their own special societies they must of course have, but a macroscopic examination is often not less instructive than a microscopic one, and the minute criticism of experts on their observations and theories which their own special societies supply will be here supplemented by a broad and liberal review, while they will here also find epitomised all that is going on of interest and importance in specialities other than their own.

I have spoken of myself as a specialist and I have done so almost with reluctance, not because I have any reason to feel ashamed of that department of practice with which I have been all my professional life associated, but because, while proud of being a specialist, I am prouder still of being a member of a great and magnanimous profession. And, indeed, I am almost disposed to think that I might argue with justice that my speciality is not a speciality at all, or, if so, only in a very restricted sense. Were I to apologise for its existence I should do so, not by urging that it is a very little one, but by boldly admitting that it is a very big one, so big that it has outgrown specialistic dimensions, and is all but coextensive with medical practice as a whole, for he who would study and treat the diseases of the mind ought to know something about all the diseases to which the body is liable. Mental phenomena depend for their origin and character upon the functioning, not merely of the brain, not merely of the nervous system and organs of sense and movement, but of the whole mechanism of the living being; and it is clear, therefore, that a study of that mechanism in its entirety is essential to a

correct understanding of all morbid mental contents. In the human polity each organ is its brother's keeper. The eye cannot say to the hand, or the head to the feet, "I have no need of thee;" and as for the brain it is responsible for every viscus, and tissue reflects with nicety each vicissitude of their existence and rules their destiny. And the medical psychologist cannot make his purview narrower than that of the organ whose maladies he professes to treat, and thus it is that his speciality is the crown of all the specialities, just as the brain is the crown of the somatic system. To a thorough knowledge of general pathology he must add, if he would faithfully fulfil his mission, an acquaintance more than superficial with ophthalmology, gynecology, laryncology, and all the rest of them, and, besides having the pharmacopœia at his finger-tips, he must be ready to prescribe those moral remedies which minister directly to a mind diseased. The conditions under which, for the most part, his practice is carried on—in large special establishments for the insane—make it needful that he should be equal to any surgical emergency, and be learned in all the wisdom of modern sanitation and public health, while a regard for his own safety and comfort, not less than the obligations of duty, make it incumbent on him to be a medical jurist and subtle in legal distinctions, and a judicious disciplinarian and governor of men.

It is obvious that a speciality so multifarious in its requirements is, as I have said, all but coextensive with medical practice as a whole, but the misfortune is with reference to medical psychology, that those who devote themselves to it are often compelled to spread themselves out far beyond medical practice, and to merge their professional speciality in non-scientific and comparatively menial avocations. As Dr. Weir Mitchell has recently told the medical psychologists of the United States, they have to become farmers, stewards, treasurers, and business-managers as well as physicians, much to the injury of their speciality alike as regards its scientific output and its status.

It is, of course, easier to point out a blemish than to suggest an effectual remedy, and as regards existing institutions for the insane it is difficult to see how a radical change in their constitution could be instantly introduced without running the risk of greater evils than those now complained of. Every department of management in an institution for the insane must be ordered

and regulated with constant reference to the mental condition of the inmates, and must therefore be under medical control; and the attempt to separate completely administration from treatment is not likely to be successful on the large scale. But still something may be done to relieve the medico-psychological speciality from the reproach which now attaches to it, and to enable it to utilise more fully than it has hitherto done the immense opportunities for scientific and psychologic research which it commands. For my own part my hopes are centred in the establishment in or near London of one or more—not asylums—but genuine hospitals for mental disease, hospitals in the true sense of the word, in accordance with the scheme submitted to the London County Council by Mr. Brudenell Carter, or with some modification of it. These hospitals would be organised like ordinary general hospitals, would have a staff of visiting and assistant physicians and of consulting surgeons and specialists in diseases of the eye and ear, and in those peculiar to women, and of resident medical officers and clinical clerks. Attached to them there would be an out-patients' department and a school of medical psychology, with laboratories and museums in which systematic investigation, teaching, and demonstration would be carried on. A few such hospitals—not mere boarding-houses or "monasteries for the mad," or convenient shoots for human rubbish, but real hospitals—would exercise at once a salutary and invigorating effect on the medico-psychological speciality, and bring it back to closer correspondence with the medical profession as a whole.

I have claimed for my speciality that it is only slightly specialistic, because those who follow it are bound to survey the whole field of medicine, and to triangulate some of the other specialistic allotments into which it is parcelled out, and I might also found the same claim upon the fact that general practitioners in medicine cannot altogether ignore it, but must to some extent acquaint themselves with its methods and participate in its work. No matter how materialistic our tendencies may be, it is impossible to get away from mind. The general practitioner has not only to treat mental diseases in their earlier and more curable stages, and to certify cases of insanity when restraint has become necessary, but he has to watch and deal with mental symptoms in many bodily diseases. The well-marked mental disturbances that sometimes accompany such diseases as phthisis and myxœdema are

familiar to all, but I am inclined to believe that every grave bodily disease is attended by alterations in intellectual associations or in the sense perceptions and emotions, for the highest nervous processes represent every part of the organism in some degree; and I look forward to the time when the diagnostic and prognostic significance of the mental symptoms of bodily derangements will be better understood than it is at present, and when it will be possible for the physician, experimentally and clinically, to measure the degree of ideational clearness in any patient. Innumerable important laws of morbid mental life still await discovery, and for help in the elucidation of these we must look to general physicians and practitioners. Dr. Hughlings Jackson has justly remarked that the study of mental diseases ought properly to begin in general hospitals, for in them are encountered those slight and transient disorders of mind which admit of comparative easy analysis. It is in general hospitals that the trifling and temporary deviations from the normal train of ideas which constitute delirium are most often met with, and in them, too, are most frequently seen those brief reductions to a state of mental automatism which follow upon epileptic paroxysms and which must be full of instruction when carefully explored.

An enlargement of our knowledge of the operations of the mind in health, may be expected from studies of it in a state of disease, but these studies, whether made by specialists or general medical practitioners, in order to be fruitful must be founded on a just conception of the relation of body and mind, and there is reason to believe that that just conception is not yet very generally accepted. It is undeniable that the notion at present most prevalent in our profession as to the nature of mind and as to its connection with cerebral changes is of a materialistic kind, and I shall venture to expend what time you will still spare me on an old controversy, often renewed, still raging, and likely to break out again and yet again in new forms; a controversy which, whether they like it or not, all medical men are at one time or another obliged to face.

There is in all mankind, it has been said, an inbred and perhaps growing predisposition to adopt materialistic constructions and to regard convictions derived from sense stimulation about the material world as having a validity that does not belong to other classes of belief. These convictions are always with us and guide

us in the daily conduct of our lives, and we raise them to a certitude higher than we allow to convictions having other sources. Nor is it strange that we should do so. If there be an external universe it is obvious that it must be advantageous that the belief in it should be accepted with absolute fidelity. For if, as Mr. Arthur Balfour has pointed out, we could suppose a community to be called into being, the members of which, in their dealings with the external world, should allow action to wait upon speculation or scepticism as to external surroundings to slacken their grasp of them, it is incontrovertible that that community would speedily be left behind by other communities of less doubting temper, and would before long be overwhelmed in ruin.

But supposing this to be so, it follows necessarily on biological principles, that faith in matter—so essential to the welfare and perpetuation of the individual and the race—will by selection and elimination be more and more deeply rooted in the organisation as time goes on. Any individual in whom that faith was qualified by doubt would incontinently perish, and only those would survive who possessed and could transmit to their progeny a prompt and unquestioning assurance of natural reality. But no such selective process would operate in favour of other faiths, however veracious, which were the growth of later and higher stages of civilised development, and which are not immediately serviceable in the struggle for existence, and hence it has come about that materialistic habits of thought have more and more obtained the dominion over us. All men, whatever their speculative opinions, enjoy a positive assurance with regard to what they see and hear, but few men have an assurance equally strong about matters of which their senses tell them nothing.

And if in the process of evolution our innate and long descended confidence in sense perceptions has produced in mankind generally a materialistic tendency, that tendency has certainly been increased and strengthened in medical men by the nature of their studies and occupations. Absorbed in the investigation of physical phenomena and of the laws by which these are connected, they have been inclined to ignore the possible existence of realities which lie beyond phenomena and are metaphysical. Engaged in watching incessantly and anxiously corporeal changes, they have been apt to ascribe a kind of corporeality to mind when dealing with its manifestations. Impressed by the results obtained in the

investigation of the functions of the organs of the human body by chemical and microscopical research, they have leant to the belief that the same methods when applied to the brain might prove that thought is nothing more than a function of its substances, or a cerebral secretion just as bile is an hepatic one.

There can be no doubt that the language used by many medical writers, and especially by those in my own branch of practice, often warrants the conclusion that they regard mind simply as a result of cerebral activity, and hold that as muscular movement is produced by certain definite processes the result of chemical transformations in muscular tissue, so thought and feeling are evolved by certain definite changes, the result of chemical transformation in the nerve centres. Now the intimate connection of cerebral function and mental activity cannot be questioned; nor can it for a moment be doubted that the investigation of this connection by observation and experiment has yielded results of the highest value, and promises still richer revelations. But the investigation will be carried on all the more fruitfully if unhampered by a false hypothesis, and it would appear to be necessary again and again to insist on the truth that mental activity cannot be referred to any physical agency, and that ingenious analogies between that activity and light, heat or electricity, however convenient they may be for illustrative purposes, do not in the slightest degree help to bridge over the impassable gulf that separates mind from matter. Mind and matter are two distinct essences irreconcilable in their nature but mysteriously accordant in their operations. One kind of motion may be transformed into another, and so may one kind of thought be transformed into another kind, but under no existing conditions can a motion pass into a thought, or a thought into a motion. For nothing can ever be derived from motion but another motion, nothing from mental process but another mental process. The two series of phenomena stand apart and are intelligible, the one only by a psychological interpretation, the other only by a mechanical one, while every effort to fuse the two together has proved futile. A neural process and a mental process have nothing in common; the facts of consciousness are not explained by the facts of brain function; psychology is not merely a branch of mechanics, and mind can have no causal dependence on matter. Function is a physiological term and is concerned with dynamics

or things physical only, and as applied to the brain, which is merely a sensori-motor machine, it has to do with the storage of energy and the liberation of energy or discharges of nerve cells, and with the resistances encountered and the degree of these. But it is movements that occur from liberation of energy and it is contrary to the principle of the conservation of energy to suppose that will or emotion or ideas, immaterial agencies, should interfere with these movements in the nervous arrangements of the highest centres, and disturb the balance between work done and the diminution of the intrinsic energy of the body and its contents.

The discoveries which have been made of late years in the histology of the brain, admirable as they have been, and useful as they promise to be in the diagnosis of cerebral disease, have not brought us one hair-breadth nearer the solution of the mystery of mind. Our minute knowledge of the structure of the eye has not helped us to translate an optical fact into a visual perception, and our minute knowledge of brain cells and fibres cannot carry us beyond the apparatus for the transmission and distribution with greater or less resistance of nervous impulses. The phenomena of consciousness are still *sui generis* and altogether disparate from the phenomena of innervation. They occur *during* not *from* the activity of the highest nerve centres.

But although mind and matter have no relation to each other as cause and effect it is nevertheless indubitable that mental changes are definitely connected with changes in the body and especially in the brain, and that there is an invariable and uniform co-ordination of the two. When the brain is destroyed or when its blood supply is cut off, mental manifestations cease; when the mind is agitated the functions of the brain are disturbed. The growth of the brain is an index of mental evolution, and the failure of the mental faculties is a measure of the decay of the brain. The intensity of a sensation varies with the intensity of physical stimulus, and with the exercise of attention there is a rise of brain temperature. How then is this close and precise connection between mind and brain to be accounted for if they are incapable of acting and reacting on each other? Simply, the answer must be, by supposing a parallelism of two causal series running side by side, but never directly interfering with each other by virtue of the incomparability of their terms. We have in our present agnosticism to revert to a provisional hypothesis, somewhat akin

to Leibnitz's famous doctrine of pre-established harmony which likened mind and matter to two clocks constructed with absolute perfection of mechanism and set going at the same moment and at the same rate, so that while each goes independently of the other they keep exact time together without any discoverable electrical or regulative connection. We have to lay down a principle of psycho-physical parallelism which assumes as an ultimate scientific fact the precise concomitance and perfect synchronism, and yet entire independence of two sets of sequences, a physical and a mental, and while diligently investigating both series of sequences, their inter-connections amongst themselves, and their concomitant variations, we have patiently to await the higher synthesis which may unite them and convert what has been called a perpetual miracle into a scientific sign.

That higher synthesis is an ideal to which by a law of our nature we must earnestly desire to reach, for it would be the introduction to that coherent theory of the universe which is the goal of all science; but it is an ideal which, with our present faculties, we are perhaps incapable of attaining. Spinoza's method of reconciling the physical and the mental by assuming that they are merely different aspects of the same thing, and that mind and body correspond with each other as do the convexity and concavity of a curve, will not help us, as we shall presently see. To congeal mind into brain is simply to avoid the difficulty, and take it for granted that there is nothing to explain. Mind is not merely matter knowing itself; observation, experiment, introspection are alike unavailing to penetrate the darkness, and our hopes of a unification of belief must be fixed on that philosophy which transcends experience, and from the facts supplied in continuous series by each science, may be able to advance beyond the point at which they stop.

But this psycho-physical parallelism or correspondence between mind and matter, although close and exact as far as it goes, is limited in extent. Vital phenomena are insignificant when compared with the physical forces which constitute the material universe, and of vital phenomena there are but a few in which mental processes can be discerned. The whole mass of organic life, animal and vegetable, on our globe is in proportion to its bulk but a film of exquisite tenuity spread over some patches of its surface like the blue bloom on a ripe plum, and brain substance,

human or animal, in this organic film, with which alone mental activities are connected, is in proportion to its superficies an infinitesimal sprinkling, like the grains and threads of gold in the crust of the earth. And of this brain substance, again only a tithe, the grey matter of the cerebral hemispheres is concerned with man's mental life. The parallelism is always between mind and the highest level of nervous evolution, and between these only. It is in concomitance with the activity of the last evolved sensory and motor centres that consciousness emerges. There are various activities of lower centres, some of them highly elaborate and purposive, which are not attended by it. And so we see that on the physical side the parallelism between mind and matter is of very restricted range.

And viewed on its mental side it is not less so. Only in the elementary processes of mind, made up of sensational and motor elements, can parallelism with physical processes be traced out. Sense perceptions and muscular movements are accompanied by physiological changes in the brain which cannot be overlooked, and it might be argued that as memories, imaginations, concepts, volitions contain sensational and motor elements, they, and all mental processes, must have a physical substratum, but the noteworthy fact is this, that there is no variation in the value of physical changes in the brain corresponding with the higher psychoses. It may be regarded as certain that when a sensory impression is conducted to the cerebral hemispheres, certain cells there undergo a change and pass into an impressed condition identical with that of the conducting nerve, precisely as a nerve cell which is the turning-point in a reflex action assumes the condition of the sensory nerve, which it transforms and passes on to the motor nerve. But the change in a nerve cell during a reflex act does not evolve consciousness, nor does the same change simultaneously taking place in a large number of nerve cells similarly employed, and as there are no grounds for believing that the cells of the cerebral hemispheres, when in a state of activity, undergo any change other than that of the impressed condition which exists in the active reflex nerve, it is a gratuitous assumption that the activity of these cells is instrumental in the production of the consciousness which accompanies it. The state of nervous impression or molecular movement, the only active state that the brain cells assume, is a physical state of a definite and constant

character, but the state of mental impression, due to the presence of an idea or feeling in the mind, is a purely psychical state, and may be infinitely varied. Physiology reveals to us an unbroken chain of movement processes in the brain, and continuous physical circuits through it from the sensory to the muscular periphery, but these processes and circuits involve molecular movement and nothing more; and whether the mind is occupied by humble feelings or transcendent ideas, by brilliant fancies or wicked impulses, there occur sensory and motor excitations, different it may be in intensity and in antecedent and succeeding movements, but always essentially the same in these diverse cases. If we could look into the living brain and observe its tissues at work accompanying mental processes, we should see throughout its different lobes and convolutions a structure, notwithstanding minor differences, fundamentally the same, and in that structure nothing but a succession of molecular movements giving no indication of their mental significance, any more than the pigments on the palette of the artist give indications of the subject of the picture which he is about to paint. The brain is built up of processes representing impressions and movements, and of nothing else. Its convolutions differ from inferior centres merely as representing more intricate and varied co-ordinations of movements than they do. It is clear then that psycho-physical parallelism is confined on its mental side to certain elementary processes, supplying the crude material of mentation to which definite movement processes in the brain correspond, and that it does not apply to the more elaborate products of our mental life which have been formed in consciousness, or to the general mental powers which are the necessary presupposition of these products.

And in other aspects the limitation of psycho-physical parallelism is obvious enough. We know that owing to the imperfection of our senses which have been evolved, not for the acquisition of knowledge but for the prolongation of life, we are utterly incapable of apprehending nature in all her length, breadth, and complexity. What we actually perceive is but a fraction of physical events lying far beyond the reach of our sentient organs. The spectrum is only a measure of the degree in which we are not colour-blind, and stone-deafness, except for a paltry eleven and a half octaves, is universal in our species. There are in nature colours we never see, sounds we never hear, vibrations

laden with tastes, smells, and tactile impressions that cannot come to us. And more than that, there are probably many aspects of nature of which we have, and can have, no inkling, for the want of additional senses which we might conceivably possess, senses of the possession of the rudiments of some of which some of the lower animals give faint indications.

On the other hand, again, we are daily conscious of the inadequacy of our mental faculties as at present constituted to satisfy our intellectual curiosity, or, while yoked with matter, to do more than give us glimpses of the great universe of mind. In our eager pursuit of knowledge we ever and anon dash ourselves against absolute contradictions in terms which only convince us of our own shortsightedness. Imagination flying forth brings back to us, like the dove to the ark, some token of a submerged world. The very sense of harmony that compels us to believe in an external reality, also demands our credence of a super-sensuous universe stretching above and beyond the plane of scientific demonstration. So limited, after all, is psycho-physical parallelism that we might almost change the simile, and liken mind and matter, not to parallel lines, but to two great spheres of vast and inconceivable contents, that as yet impinge upon each other at one point only.

But the narrow boundaries of the psycho-physical parallelism of which I have been speaking have not prevented its translation into the crudest materialism. As far as the parallelism exists, mind is bound up with the attributes of matter, and it is an easy step to suppose that it is a function of the cortical substance of the brain. This step was taken by the phrenologists who localised the several faculties into which they arbitrarily divided mind, causality, time, order, colour, tune, language, wonder, benevolence, destructiveness, &c., in particular parts of the brain. Now I would speak of the phrenologists with the utmost respect, for they gave a powerful impetus to the study of cerebral structure and of psychology, were the first to attempt experimental psychological investigation, and collected much valuable information, but they fell into grave error in substituting an anatomical for a physiological parallelism, and in identifying physical processes with mental capacities and powers. Not less erroneous, and even more ridiculous, are the conclusions of those who are practically the followers of the phrenologists in

these days, who, founding upon recent discoveries in cerebral localisation as regards sensations and movements, propound a still more bureaucratic theory of mental and cerebral connection, and assume that every thought has its pigeon-hole, every idea its special nerve cell or neurone. Breaking up the so-called mental faculties into their constituent ideas, they have distributed these among the morphological units of the brain, and in doing so they have overlooked the highly complex nature of these cerebral processes that are involved in the formation of an idea. There is no mental atom indivisible, unalterable, and eternal. To the making of an idea there go a number of associated combinations of sensory and motor elements, and an idea can therefore have no circumscribed or local habitation in the brain. It consists, except where it is a simple revival of one sensory impression or motor impulse, in a gathering up or re-excitation of activities in several sensory and motor regions. A single rod or cone of the retina cannot be the seat of a visual image, and no more can a single cell of the visual area be the seat of a visual idea. The localisation hypothesis is seen to be untenable the moment that the attempt is made to apply it, for there are no individualised or isolated ideas in the mind ready, like a jack-in-the-box, to jump up into consciousness on the touching of the appropriate spring, but merely ideational elements capable of blending in infinitely varied combinations, and the young medical psychologist who piqued himself on having discovered a delusion cell was himself the victim of a profound delusion.

But if the principle of psycho-physical parallelism refers only to elementary physical and mental processes—and leaves out of account the more complex activities on either side—we need not therefore be the less zealous in tracing it out as far as it goes. The two processes to some extent supplement each other. Where a link is still wanting in the one chain, its existence may be inferred from the already demonstrated continuity of the other, and a realisation of the essential difference of bodily function and mental manifestation in no way discourages the diligent study of both in their mutual relations. To us, as medical men, that diligent study becomes a pressing duty, and from our skilful performance of it valuable results may, as I have said, be expected to flow. We must regard man not merely as a material object amongst other material objects, but as a living organism and

a living soul, "a reasonable soul and human flesh subsisting" together in their ceaseless if still inextricable harmony, making up the individual life—that individual life which is for us, not a petty episode in the history of the universe, but the all in all —the primary object of our solicitude and thought and hope. Man is our speciality, and it is one to the generalisation of which there is no limit, for "the condensation of nebulæ into suns and planets and the breaking up of worlds are only barren scenic effects" or mere sound and fury, signifying nothing, unless they are in some way linked with his sentient being, and the æons of eternity, past and to come, are uninteresting when they have no relation to his seven ages.

THE OPERATION FOR THE RADICAL CURE OF HYDROCELE BY EXCISION OF THE SAC, ILLUSTRATED BY A SERIES OF CASES.

By C. B. Lockwood, F.R.C.S. Eng.

I venture to introduce this subject because it has not yet been discussed by the Medical Society of London, also because the operation for the cure of hydrocele by excision of the sac does not seem to be so well known as it undoubtedly deserves to be. During the last 10 years (1885 to 1894 inclusive) 113 cases of hydrocele were treated by operation in the wards of St. Bartholomew's Hospital,* only 13 of these are said to have been treated by incision and excision of the sac wall. 48 of the remainder were injected with iodine; 45 are said to have had radical cure done; and, lastly, seven were treated with setons. With the help of Mr. E. G. B. Adams, to whom I am under a great obligation, I have examined the notes of these cases. There is no doubt but that the 45 who are said to have been treated by "radical cure" had the hydrocele injected with iodine, black wash, or carbolic acid, the last two being used in a very few instances. Hydrocele is such a common disease and causes so much mental and physical inconvenience that some good reason must exist to explain why only 110 cases passed through the wards of a great hospital in a decade. I

* 'St. Bartholomew's Hospital Reports,' Statistical Tables, prepared by the Surgical Registrar. Three cases treated by seton are accidentally omitted in the year 1889.

myself am inclined to attribute it in a measure to the uncertainty of injection, and to the fact that besides being uncertain it is very painful. My own observations have long caused me to look askance at this procedure. That it often failed there could be no doubt, but I did not know in what proportion; that it was exceedingly painful was also evident; and that epididymitis and orchitis were not infrequent consequences could not be denied. Now, whatever the patients themselves might think, it seems evident that one would be chary in recommending an operation which, after much pain and discomfort, might not succeed, or which might leave the patient with an additional disease. With regard to the question of failure I was not astonished to read in Mr. Jacobson's recent work that he estimates the failures after injection at from 8 to 10 per cent.* The exhaustive labours of this writer and his temperate and judicial attitude give great weight to this statement.

With the help of Mr. Adams I have examined the notes of the cases of hydrocele in the wards of St. Bartholomew's Hospital during the last 10 years. We have abstracted the notes of 74 patients who had been treated by injection, the total number of injections being 93. In six of these the ultimate result was doubtful; they were not cured when last seen.† In 24 the injection had undoubtedly failed. The above seems a very high proportion of failures. It is to be remembered, however, that many of the cases may have been admitted into the hospital because they were known to be intractable. Nevertheless, they deepen my own distrust of the so-called cure by injection. The history of these 24 failures is remarkable: 10 failed after one injection, 11 had two injections, one had three injections, and two had four. In those which had two, three, or four injections the result is in many cases unknown, but some were ultimately treated by excision of the sac. Of the two cases which were tapped four times, one, a medical man, tells me that he now, after much suffering, has a spermatocele; the other seems to have been cured by carbolic acid after three injections with iodine. The patient who was injected three times had a most remarkable career. His hydrocele, which is said to

* 'The Diseases of the Male Organs of Generation,' p. 141. London, 1893.

† One has since written to say he considers himself well, the swelling having "gone right down." I am greatly obliged to Mr. Maxwell for much help in obtaining the addresses of these cases.

have followed a blow, was tapped, thrice injected with iodine, twice incised and drained, and, finally, laid open, painted with liquor iodi, and packed with iodoform gauze. There is reason to believe that this was successful. The case was described by Mr. Willett in the discussion before the Royal Medical and Chirurgical Society.* It may be noticed that excision of the parietal layer of the tunica vaginalis was not performed.

Out of the 24 operations which I have now done for the cure of passive hydrocele, two had previously been injected with iodine and relapsed. When the tunica vaginalis was opened no adhesions were found, but in one the testicle was chronically inflamed, although the injection had been done 18 months before the operation, and the other has still a nodular condition of the testis and epididymis. These two cases of relapse are included in the 24 which have just been mentioned. Thus the chances of relapse after an attempt at cure by injection are very considerable; rather over 32 per cent., according to the statistics of St. Bartholomew's Hospital. Evidently the operation is not one to be recommended with confidence. With regard to the painfulness of it, I feel sure (in spite of the enthusiastic statements of some surgeons) that it is considerable. Putting aside what I myself have seen, it is clear from the notes that, although cocaine was freely used, pain which needed morphia for its alleviation was quite common and occasionally was so severe as to make the patient sick. It seems unreasonable to suppose that a violent irritant can be applied to the surface of a sensitive organ like the testicle without causing considerable pain. Two of the patients upon whom I operated for radical cure of hydrocele by excision of the sac had, as I have just said, previously been operated upon by the injection of iodine. They were most emphatic that the excision was much less painful, and was, indeed, comparatively comfortable compared with injection. Nor am I convinced that injection with carbolic acid has the advantages which some have claimed for it. I can only find that five patients were injected with carbolic acid in the wards of St. Bartholomew's Hospital, in the 10 years 1885 to 1894 inclusive. They received six injections. Two of these injections failed. In one case a second injection with carbolic acid seems to have succeeded, but it is said that the epididymis was much enlarged. In a second case

* 'The Lancet,' March 3rd, 1888.

an unsuccessful injection with carbolic acid was followed by an unsuccessful injection with iodine. Finally, the parietal layer of the tunica vaginalis was excised. The other three patients were probably cured by one injection with carbolic acid. One is said to have suffered pain. This might be expected. Experiments upon animals incline me to think that carbolic acid is a violent remedy, and no one can deny that the testicle is a sensitive organ.

I do not propose to discuss all the alternatives to injection. A case has been mentioned in which incision and drainage failed twice. A diverticulum of the tunica vaginalis may, it is said, have been the cause of these persistent failures. Setons were inserted seven times into the hydroceles of infants and young boys. One of these is known to have relapsed and had a seton inserted for the second time. Partial excision of the parietal layer of the tunica vaginalis has also been tried. In one of these it is said that "so much of the sac was removed that it was difficult to bring the remainder together." The wound was drained for fourteen days, but, nevertheless, before the man left "a small fluid tumour had already returned." Incision of the tunica vaginalis and after-packing with lint and subsequent sepsis and suppuration is a repugnant procedure. Excision of the sac, on the other hand, may be rendered an aseptic process, and seems to me to afford an excellent prospect of success. It seems reasonable to suppose that the removal of about nine-tenths of the diseased secreting membrane, and the exposure of what is left to the loose cellular tissue of the scrotum, could hardly be followed by a re-accumulation of the hydrocele fluid. The results of the operation will, I think, go far to show that this assumption is correct. And here it is to be said that the title of this paper is not strictly applicable to the operation performed upon ordinary hydrocele of the tunica vaginalis. For the cure of these, only the parietal layer of the tunica vaginalis has been excised (Fig. 1), but in encysted hydrocele the whole sac is cut away. I have now excised the whole of the parietal layer of the tunica vaginalis 25 times. All of these were done for the cure of hydrocele, with the exception of one which was done for hæmatocele. No attempt whatever was made to select the cases. The youngest was 16 years old, the oldest 68. Some could hardly be considered good subjects for an operation. A man aged 41 had been a heavy drinker. His face was covered with acne rosacea. He had a high tension pulse,

and probably some aortic stenosis. His urine contained a trace of albumen. He took ether well and suffered no apparent harm from the operation. A man aged 63 who had acne admitted that he drank; another, who was a plumber, suffered from lead poisoning; several had chronic bronchitis. This is a very objectionable complication, on account of the anæsthetic. However, by choosing the warm months of the year for the operation and by skilful administration of the anæsthetic this complication need cause little anxiety. In several cases the hydrocele was accompanied by other affections. In one, a hydrocele on the right side and a varicocele on the left were operated upon at the same time. In another, both sides were operated upon at the same time, the hydrocele being double. In another case the presence of an acquired hernia upon the same side as the hydrocele made no difference. A man who had a hydrocele and organic strictures of the urethra was operated upon first for the cure of the hydrocele, and a week later for the cure of the strictures. The last operation was followed by orchitis. In one case the hydrocele was bilocular. The testicle was surrounded by an ordinary hydrocele of the tunica vaginalis. A second large sac, full of about half a pint of clear yellow fluid, lay above the head of the epididymis. Both sacs were treated in the usual manner, the upper one being entirely removed. The operation was performed for various reasons—in some because of the size and weight of the hydrocele; in others for pain and discomfort, especially whilst riding upon horseback. Some were done to enable the patients to enter the army or other public services. One was done to enable the patient to wear a truss for a hernia which was unsuitable for radical cure. Some were performed because the patients were weary of being tapped; one man had been tapped 24 times. One patient was alarmed because his hydrocele had been burst at football. This accident had not brought about a cure, as happened to a man I saw under Mr. Butlin's care, and of whom it is stated that his hydrocele had been burst by the wheel of a wagon passing over it. Another reason might, I think, influence the decision. At various times I have dissected a number of hydroceles. In the large ones of long duration the testicle had become flattened out and wasted, and apparently spoilt. In some of the operation cases the gland was considerably altered, the epididymis having become separated from the body of the testis.

Before operating for the radical cure of hydrocele by excision of the sac, it is, as a rule, advisable to tap once to ascertain the condition of the testis. It would be disappointing to find a gumma, or a mass of tubercle, or even a malignant growth. Inasmuch as the fluid in a hydrocele is quite thin, like water, a very small trochar and cannula suffice for the tapping. A cannula of 2 mm. diameter is quite large enough. The instrument usually figured in text-books is a relic of mediæval surgery. Strange to say, one of those upon whom I intended to operate underwent spontaneous cure. A man aged 65 came in January, 1894, with a hydrocele of two years' duration. It had been tapped five times. He had bronchitis, so I tapped it again and told him to come in June to be cured. He returned in June with no trace of hydrocele, and said that after the tapping it had rapidly refilled and then got quickly well. He remains quite well of his hydrocele at this date (October, 1895). He attributed his cure to some spirits of camphor which he was taking. I also find it stated in the notes that a youth, aged 17, who was under the care of Mr. Thomas Smith, had undergone spontaneous cure of his hydrocele. He had had it three years, and it had been injected once with iodine, but had relapsed. No reason could be assigned for the cure. This event is, of course, too rare to have any practical bearing upon the question of operation.

The operation of excision of the parietal layer of the tunica vaginalis is exceedingly simple. An incision is made the whole length of the long axis of the hydrocele. The sac is exposed and separated from the scrotum until the spermatic vessels are almost in view. It matters little if the testicle is entirely withdrawn from the scrotum. A puncture is made to let out the hydrocele fluid. This small opening is enlarged to admit the finger to ascertain the position of the testicle, epididymis, and vas deferens. Occasionally the vas is upon the front of the sac, having been displaced. The testis, too, is sometimes in front, as in one of my cases. As a rule this point will have cleared up before the operation is begun; but when the sac is thick the shadow of the testis cannot be seen. The finger in the sac also makes out the exact limits of the epididymis and of the testicle. In big old hydroceles these organs are flattened out and sometimes pulled apart. In one of the cases upon which I operated this had happened, and the epididymis, separated from the testis, lay almost in front of the sac.

These points having been cleared up the whole of the parietal layer of the tunica vaginalis is cut away to within a quarter of an inch of the testicle and epididymis, so that these organs are left in the condition shown in the accompanying sketch. (Fig. 1.) Much misconception seems to exist as to the quantity of tunica vaginalis which is taken away. I am continually asked whether the visceral layer is dissected off the testis and epididymis. Sometimes in very big hydroceles the tunica vaginalis runs up the

FIG. 1.

Showing how much of the tunica vaginalis is removed for the cure of hydrocele.

front of the spermatic cord. This prolongation must be thoroughly removed. The arrest of hæmorrhage is of the utmost importance in this, as in other operations upon the scrotum. A hæmatoma easily forms in the scrotum and detracts considerably from the comfort of the patient and from the success of the operation. In one of my cases no vessel required ligature, but, as a rule, from eight to twelve have to be secured with fine twisted silk. As a further provision against a hæmatoma a large drainage-tube ($\frac{1}{3}$-inch diameter) is laid along the depths of the wound and brought out at its upper

angle. The rest of the skin incision is closed with fishing-gut sutures placed about a third of an inch apart. Trouble expended in obtaining accurate apposition of the wound is well repaid. The skin of the scrotum heals with great rapidity, and the union becomes quite strong in a week. It may be observed that no caustic is applied to the visceral layer of the tunica vaginalis, which is, of course, left behind. I do not think such applications are required, and they would increase the pain and also cause orchitis. As I have said, 24 hydroceles were treated in this way. In addition a hæmatocele was met with, and received the same treatment. After all the blood and clot had been taken away the whole of the parietal layer of the tunica vaginalis was excised. The after-treatment was the same as that of the hydrocele cases, and will be described presently. Repair was rapid, and the after-result left nothing to be desired.

It would not, in my opinion, be justifiable to perform these operations for the cure of hydrocele without stringent asceptic precautions. Inasmuch as surgeons differ as to what these should be, perhaps I may be allowed to say very briefly what was done in all of these operations. The aseptic precautions pertain mainly to the preparation of the patient, of the surgeon and his assistant, and of the instruments and materials. The evening before the operation the patient is thoroughly shaved and has a hot bath with abundant soaping and scrubbing. The skin having been cleansed as far as can be done by soaping and scrubbing, it is further prepared for disinfection by extracting its fatty matter with ether or turpentine. It is disinfected by being washed for two minutes with a 1 in 500 solution of biniodide of mercury in rectified or methylated spirit. This is washed away with biniodide of mercury lotion (1 in 2000), and the skin is covered with a covering of carbolic gauze wet with the same lotion. It is, I think, advisable to add some glycerine to this lotion to help to keep the covering moist and assist the chemical to penetrate the skin. It is usual, also, to give a mild purge the night before the operation. These precautions are used for hospital patients; but for others, less drastic measures usually suffice. The hands of the surgeon and of his assistants are apt to be a source of infection. After cutting the nails short, and scrubbing for three minutes with soap and hot water, we disinfect them by soaking for two minutes in the same solution of spirit and biniodide of

mercury (1 in 500) as was used for the patient's skin. This has hardly any harmful effect even upon delicate skin. My hands are quite unable to bear the strong solutions of carbolic acid which some surgeons recommend. Very few instruments are required; a knife, a pair of scissors, a needle, and a few pairs of pressure forceps are all that is necessary. These, together with the drainage-tube, are sterilised by boiling for a quarter of an hour. Fine twisted silk (No. 0 size) is used to ligature bleeding vessels, and fishing gut for closing the incision. These are also sterilised by boiling, and, together with the instruments, are afterwards kept in freshly made carbolic solution (1 in 40). After the patient has been anæsthetised, the field of operation is prepared by removing the protective dressing and thoroughly wrapping up the penis in carbolic gauze which has been soaked in biniodide of mercury lotion (1 in 2000). This "phallic shield" is of the greatest importance in this and other operations about the genital organs, especially in operations for varicocele and for the radical cure of hernia. The area of operation is surrounded with towels sterilised by boiling or steaming for half an hour, and kept wet with 1 in 40 carbolic lotion. One of these towels is passed across the thighs and under the hydrocele to support it. Before making the incision the skin receives a final swabbing with spirit and biniodide, and is then sluiced with 1 in 2000 biniodide of mercury lotion, which is used throughout the operation. I use sponges prepared by the sulphurous acid method.* The wound is dressed as follows:—After a thorough dusting with iodoform crystals the scrotum is covered with a layer of 5 per cent. carbolic gauze soaked in biniodide of mercury lotion (1 in 2000). This is covered with alembroth wool and an outside dressing applied. The outside dressing is the usual eight-fold layer of carbolic gauze with a covering of jaconet. It is accurately cut to pattern and fitted with great care. (Fig. 2.) It is triangular, with an aperture near the base for the penis to pass through. To the apex of the triangle two strong bands are fixed. When the dressing is in position, these bands fix its apex against the perineum and are carried round the thighs to meet the pelvic band in front. This is a similar band of soft material

* "Report upon Aseptic and Septic Surgical Cases, with special reference to the Disinfection of Skin, Sponges, and Towels." C. B. Lockwood, 'British Medical Journal,' Jan. 27th, 1894.

FIG. 2.

Outside dressing used after operations upon the scrotum. From a photograph by Mr. Horder.

which is fastened to the other angles of the dressing. They secure it firmly in position by being carried round the pelvis. The straps are best made of stout bandage or of webbing. After they have been pulled tight a little extra alembroth wool may be stuffed beneath the dressing to exclude air and make some pressure upon the scrotum. I have used this dressing now for a great number of cases of radical cure of hydrocele and varicocele, for castration, and other operations on the scrotum. I have no doubt but that other surgeons have bethought themselves of such a simple device. It is quite safe and very easy to adjust. The patients find it most comfortable, and are able to turn about in bed, and, if necessary, get up with it on. It enables us to dispense with bandages, always difficult to apply in this region, and notoriously insecure. The after-treatment of these cases is simple and uniform. After the anæsthetic has passed off any light diet may be given, and the minor indulgences need not be stopped. The dressing is taken off at the end of 48 hours for the removal of the drainage tube. This is done with the same precautions as those used for the operation. On the seventh or eighth day the dressing is finally removed and a suspensory bandage of linen applied. The patient now gets up to lie on a couch, and is able to begin work again within a fortnight.

The immediate results of excision of the parietal layer of the tunica vaginalis seem to leave little to be desired. The asepsis, which is so essential to safety, seems easy to secure. Only one of the cases had subacute suppuration, which was by no means severe.* Owing to his physical conformation urine escaped several times into the dressing. We were aware of the likelihood of this accident and endeavoured to shut off the wound with iodoform, collodion, and so forth. The man, however, was negligent and unintelligent, and did little to aid our efforts. Seven months after the operation he was quite cured, and, except for the scar, it would be impossible to find anything abnormal.

A striking feature of these cases has been the absence of orchitis. The case which has just been mentioned is supposed to have had some orchitis, and a youth was found to have some orchitis at the operation; but I am not aware that any of the others had it. Indeed, the testicle seems to be surprisingly tolerant of any reasonable amount of handling. With the above

* *Author's note.*—September, 1896. Eight more operations have since been done without further suppuration.

exception the after-course of these 25 cases has been quite monotonous. The drainage-tube was withdrawn in from 40 to 48 hours, and the stitches removed six days later. By this time the wound was healed and merely required protecting with a little wool. After the removal of the stitches the patient was provided with a linen suspender, and got up to lie upon a couch. He was usually fit for work within a fortnight. The patients themselves greatly appreciate the relief which the operation affords, and have been profuse in their expressions of gratitude.

I think the foregoing shows that when excision of the parietal tunica vaginalis is done with strict aseptic precautions the immediate results of the operation leave little to be desired. The greatest pains have also been taken to ascertain the after-results. It may be noted that we have to deal with 23 patients upon whom excision of the parietal layer of the tunica vaginalis had been practised 24 times, the hydrocele having been on both sides in one instance.

Everyone will acknowledge the extreme difficulty of tracing cases in London. I have, however, succeeded in following up 16 of these patients. Fourteen have been seen by myself or other surgeons, and are all cured, including the case of double hydrocele. Two have written to say they are cured. One of these patients has been well for close upon two years, two over 18 months, and none less than three months. To these may be added another case, that of a man upon whom my friend and colleague, Mr. Bowlby, performed exactly the same operation. It was done on November 7th, 1894, and the patient is now quite well (October 4th, 1895).* Thus I have not yet met with a relapse after complete aseptic excision of the parietal layer of the tunica vaginalis. I am fully aware that relapses have been described,† but it is probable that those cases were not operated upon in the same way as those dealt with in this communication.

Examination of cases which have been operated upon shows that the scar of the incision is hardly visible. The testicle slips

* The patient, together with 14 others, was shown to the Medical Society at the meeting.

† "Some Remarks on the Radical Cure of Hydrocele, with Notes of Two Cases of Excision of the Tunica Vaginalis, followed by Recurrence of the Hydrocele." (Henry Morris, 'Transactions of the Royal Medical and Chirurgical Society,' Feb. 28th, 1888). For report, *vide* 'The Lancet,' March 3rd, 1888.

about quite freely within the scrotum. The gland in most cases is larger than its fellow, but quite soft and painless. I have observed this slight enlargement in cases which have been cured by iodine. It has probably nothing to do with the operation, but is related in some way to the hydrocele.

It is not intended upon this occasion to touch upon the pathology of hydrocele. Doubtless more than one cause has to be considered. Dr. Kanthack, pathologist to St. Bartholomew's Hospital, kindly examined the tunica vaginalis removed from two cases of passive hydrocele. He found in the thickened membrane evidence of chronic inflammation. At my suggestion tubercle bacilli were sought for, but none were found. The mammillæ scattered over the thickened tunica vaginalis in cases of hydrocele are very suggestive of tubercle.

Inasmuch as they have the closest relationship to the cure of ordinary passive hydrocele, I propose to mention very briefly a case of operation for congenital hydrocele and another one in which there was hydrocele associated with hernia. The first was that of a youth who had a congenital hydrocele of the right side. The fluid in the sac could be reduced into the abdomen. An incision was made over the inguinal canal, and a long, narrow peritoneal tube was found leading into the general peritoneal cavity. This was separated from the spermatic cord and divided, and the stump fastened beneath the arching fibres of the internal oblique and transversalis.* The inguinal canal did not require repairing, but the external abdominal ring was closed to its proper size with the usual silk sutures. No drain was inserted, and the wound healed by first intention. It will have been noticed that the tunica vaginalis was not touched, but was left alone, as in an ordinary case of congenital hernia. I now regret that I did not excise the parietal layer, because five months after the operation there was some swelling about the testicle and perhaps a little fluid in the tunica vaginalis. The removal of the parietal layer of the tunica vaginalis in a case of this kind would be a very slight addition to the operation. In future I shall certainly take it away. Indeed, in another case of hydrocele which was associated with hernia this proceeding was adopted. The hydrocele seemed like one of the ordinary kind, but the

* "The Radical Cure of Femoral and Inguinal Hernia." By C. B. Lockwood. 'The Lancet,' Nov. 25th, 1893.

cord was thickened, and it was thought that there was a narrow and patent processus vaginalis plugged with a strip of omentum. The operation which I usually perform for the radical cure of hernia was done.* The peritoneal canal was occluded and the inguinal canal repaired. The lower part of the sac was laid open and in great part removed. It was difficult to make out its exact relation to the testicle, but it closely enveloped it and was, I thought, composed of the upper but not the lower part of the tunica vaginalis. This wound was not drained, and healed by first intention. Mr. Withers informs me that the hydrocele is cured. It is hardly necessary to point out that the above was a chronic hydrocele of a hernial sac. I have many times met with acute hydrocele in strangulated hernia, but in these it seems unnecessary to excise any of the tunica vaginalis. I have never known the effusion to return and persist after it has been evacuated.

Encysted hydroceles of the spermatic cord are also most suitable for excision of the sac. Apart from cases of hernia, I have not myself had an opportunity of dissecting out the sac of an encysted hydrocele of the cord. It is, however, a simple and safe procedure and much to be preferred to injections. From the nature of the case a relapse could not occur. Two patients who were operated upon by other surgeons write to say they are cured.

Mr. Swinford Edwards said he had had considerable experience in the treatment of this disease, including the particular treatment described by the author. He had, however, only thought it necessary to resort to this measure, *i.e.*, that of excision of the parietal tunic, in relapsed cases. When he was house surgeon at St. Bartholomew's Hospital he had been struck by the large proportion of relapses after the injection of iodine in the hands of the resident staff, this proportion amounting to not less than 25 per cent. When he went to St. Peter's Hospital he remarked, on the contrary, the invariable success that attended injection of iodine, and, on inquiry, he had found that at the latter institution they made use of the Edinburgh tincture of iodine, which is twice as strong as the English preparation. This fact he thought had a good deal to do with the success of the injection, the relapses not being more than 2 per cent. There might be another cause of the want of success in the treatment by injection, viz., that such cases could hardly be expected to do well if there happened to be any chronic inflammation going on about the testicles. Then, too, the cyst might be multilocular, as in a case he had recently met with in which he had performed the more radical operation of excision of the sac as a whole. He mentioned that his attention had been called to the use of perchloride of mercury (gr. 1 ad ℥ j) as an injection. He had been requested to make use of this substance by a medical man who was

* 'The Lancet,' Nov. 25th, 1893.

himself suffering from hydrocele. This gentleman had presented himself a month later completely cured. There had been no pain whatever, in fact he had gone back forthwith to his home in the country and did not lay up a single day. With this experience in his mind he inclined to the idea that there might be a field for the sublimate in this direction. He added that if he himself were the subject of hydrocele, he would prefer to try treatment by injection before submitting to the radical operation.

Mr. Bryant congratulated the author on his numerous successes, although he was not prepared to endorse all his conclusions. He asked for further details concerning the average duration of the treatment. The author had stated that in one case the man was well in a week; but he presumed that it was not intended they should infer that the patient was able to return to work in that time. He recognised the value of the treatment advocated by the author, which, or something like it, he had himself employed. He had, however, only had recourse to the operation after the treatment by injection had failed to effect a cure. He felt strongly that one cause of the failure of the treatment by injection was the one suggested by Mr. Edwards, viz., the employment of too weak a solution. The old tincture of iodine of the London Pharmacopœia was two-thirds the strength of the ordinary tincture. For the last 20 years he himself had been in the habit of using a mixture of equal parts of the liquor and the tincture, two or three drachms of which he injected into the sac. Most of the cases had proved successful, and he attributed the failures with which he had met in early life to his having used the ordinary tincture. He was of opinion that the proper treatment for hydrocele was really by injection, and it was only in the more severe cases that this apparently more severe operation could be required. He mentioned that some years ago it had been suggested to him to try the effects of hot water as an injection, and he had used it in four successive cases. In two of these the hydrocele was cured very rapidly, though the injection caused subacute inflammation and a good deal of effusion which subsequently underwent absorption. He had followed up these cases and they had remained well. In the other two cases suppuration followed, although the water used had been boiled. These were treated by free incision and ultimately resulted in a cure. He had also tried carbolic acid, but only in a few cases, and his experience of it had been favourable. He had only been tempted to resort to excision of the sac in three cases. As a rule what he did was to cut away a considerable portion of the tunic, swabbing out the cavity with a solution of chloride of zinc—20 or 30 grains to the ounce—or with carbolic acid, and then plugging with iodoform gauze. Under this treatment the cavity rapidly contracted without suppuration. That appeared to him to be a more simple proceeding than the plan suggested by the author, and equally successful.

Mr. Wallis said he had been working upon much the same lines as the author for the last three years. His cases were seven in number. In his first case, which was one of double hydrocele, he excised the sac and brought the edge of the tunic over the testicle. The patient—a boy—was quite well in eight days, and left the hospital in a fortnight. Unfortunately, however, the hydrocele re-formed. The next case was that of a boy with a thickened sac who had been tapped several times. As the boy was a candidate for the post office, it was resolved to attempt a radical operation. On opening the tunica vaginalis, he came upon two or three black-looking masses situated on the testicle, which was somewhat enlarged. These were old hæmorrhages due to previous punctures. The

visceral layer over the testicle was markedly hypertrophied, and he therefore scraped it away with a spoon, and then brought together the two layers over the testicle, uniting the skin over it, and the operation proved remarkably successful. The boy had no orchitis, and recovered perfectly, without drainage. The wound was closed with collodion, and he left the hospital in a fortnight. Two other cases were young men who wanted to enter the army, and one other was an old man. In all he used the spoon to scrape the testicle, and he had been struck by the fact that with the exception of one, which suppurated, there was no orchitis. The postman had never had any return, though the testicle remained apparently enlarged. He had been unable to trace the men who went into the army, but they were still free seven months after the operation. None of the others had had any return. He had never used a drain, and with the exception of the one unfortunate case which suppurated, the cases had done exceedingly well.

Mr. Bidwell thought the author had done them a service in bringing the subject forward. During the last five years he had adopted this treatment, but in some cases he found that patients objected to an operation necessitating the use of an anæsthetic, and preferred a method of treatment in which this could be dispensed with. He had, therefore, been obliged to have recourse to injection in such cases. In two cases which he treated by excision after failure by injection, he had, contrary to the author's experience, found some adhesions in consequence of the injection. In his first case he had used a drain, but as some orchitis ensued, in the following cases he dispensed with its use, and completely closed the wound. In his experience the wounds had done perfectly well, and the patients had been well at the end of a week, leaving the hospital, as a rule, at the end of ten days. He dissented from the view that the operation was more severe than that by injection. In all his injection cases the patient had been laid up for a longer period than ten days, and with hospital patients this was a serious matter. He had operated upon patients from 8 to 60 years of age, and he fully endorsed the author's views. He asked whether the author had had an opportunity of examining any of his patients *post-mortem*, remarking that the skin seemed so movable over the testicle that it seemed as if there must be some reformation of a parietal layer of the tunica vaginalis.

Mr. Lockwood, in reply, said he had been quite prepared for very striking differences of opinion, in fact he quite expected the surgeon who was of opinion that the injection of iodine was a pleasing and even a soothing proceeding. He had watched it for a good many years and had come to the conclusion that the injection of iodine was distinctly a painful process, one which he would strongly object to undergoing himself. The percentage of failures, even in skilled hands, were very great; and in that case all the trouble and suffering would be undergone for nothing, in addition to the risk of the patient being left with a disease which he did not have before the operation—in the shape of epididymitis or orchitis. He remarked that in the cases of relapse brought forward by himself the patients had been injected with all kinds of things, including the Edinburgh tincture. It might be concluded that his cases were bad ones, as otherwise they would not have found their way into the wards. The treatment by operation was rapid and effectual: only one patient was in the hospital for a month, and all the others recovered well within a week and left the hospital in a fortnight. He held that the treatment by excision of the sac was much simpler and less troublesome, as well as less

painful, and altogether a better proceeding than the so-called cure by injection. It also had the additional advantage that it *cured* the disease. That was a point upon which stress ought to be laid. He declined to admit that it was a more severe operation than that by injection. Two of his patients who had previously undergone the latter were very decided as to this, and declared that nothing would induce them to submit to it again. He had refrained from applying anything to the testicle because he considered epididymitis or orchitis a great calamity. He admitted that erasion of the visceral layer might be advisable in some cases, but none of his cases appeared to require it. He usually drained scrotal wounds. He had seen, at various times, disasters in the way of hæmatoma, &c., so he preferred to drain. It could not do any harm, and he thought it was a wise precaution. He had not had an opportunity of examining the actual condition in any of his patients, but should an opportunity occur he would not fail to avail himself of it.

October 28th, 1896.

TWO CASES OF INTESTINAL RESECTION FOR CANCER AND ONE CASE OF "INTESTINAL EXCLUSION."

By C. B. Keetley, F.R.C.S. Eng.

Case 1. *Intestinal exclusion in a case in which an artifical anus opened into a coil of small intestine, which, in turn, communicated by a fistulous track with the rectum.*—I saw a young lady, aged 17, a patient of the late Mr. Bruce Payne, on January 25th, 1894. Her illness began a year previously. Pus had been escaping per anum, and the temperature had been hectic all the time. The illness had followed exposure of the feet and legs to cold and wet. On examination I found that the hypogastrium was the seat of an abscess on the point of bursting, the skin being blue and thin, and an area of œdema spreading widely around it. With Mr. Payne's help, and that of Dr. Trethowan, I incised the parts freely, and followed up the suppurating tracks wherever they had burrowed, both in the abdominal wall and pelvic cavity. The pus was fæcal, and one track led into the rectum. The uterus and its appendages were held stiffly in one position, the uterus over to the right, by inflammatory thickening in the broad ligament. The right Fallopian tube felt hard, thick, and convoluted, but the ovaries seemed normal and not adherent

peritoneally. A minutely careful process of scraping and sponging was gone through, requiring free incisions, two of which divided the recti over the pubes. My experience is that mere drainage is all but useless in such cases. The peritoneal cavity was opened, but not until the cleansing process was finished. It could not be closed again, as the hypogastric parietal peritoneum and sub-peritoneal tissue were too soft to hold sutures. Drains were arranged, sutures passed through the skin, aponeuroses, and recti. An aperture still remained, leading into the peritoneal cavity, which was closed with iodoform gauze. The wound was dressed night and day, on the following day (Friday), and again on the Saturday morning by myself. A fortnight afterwards I saw the patient again. Her general condition was very good, but a regular false anus leading into the small intestine was developed at the bottom of the wound. I recommended the recesses of the wound to be washed out with iodine water, and once a week with nitrate of silver (5 gr. to 1 oz.), and an occasional injection of iodoform in oil. When I next saw this patient, nine months afterwards, the fæcal fistula leading into the small intestine was large enough to admit a hen's egg with ease, and from it another fistula about 3 inches long, led straight into the rectum. It would be wearisome to relate how I tried to remedy things by plastic operations with very little benefit. There was no difficulty in keeping the temperature down and the general condition good in a nursing home in London, but in spite of the sea air the patient always had some degree of hectic at home, though nothing like what had sapped her health before the original operation. Finally, on April 17th, 1895, the following operation of intestinal exclusion was performed. Mr. Lloyd administered the anæsthetic, and Mr. Scott Elliot and Mr. H. Wharry assisted me. Measures were taken to keep the patient warm. The ileo-rectal fistula was thoroughly cleansed. The incision was semicircular and transverse through the recti. She was now placed in a semi-Trendelenberg's position. I separated the intestinal and mesenteric adhesions to the abdominal wall near to the fæcal fistula, care being taken not to tear those immediately around the fistula, half an hour being thus occupied. The condition then existing is shown in the annexed diagram. Four constricting rubber tubes were applied at A, A′, B, B′ respectively, and a short longitudinal slit made at D. Transverse division at C and C′ permitted

suturing of C to C′ to be performed by Maunsell's method—*i.e.*, after both ends were intersuscepted through the segment C A, and out at the slit D. Silk-worm gut sutures were used. The excluded ends were then sewn up. The part E was drawn inside out through the artificial anus, and then sewn up. On returning it, however, I could not satisfy myself that it was securely closed, so I did this part of the proceedings over again. The same half-closed appearace again presented itself, but I then found it was only apparent. The part F could not be turned inside out, and was closed from the peritoneal aspect. No drainage was used. The patient's recovery was interrupted by the formation of a

FIG. 1.

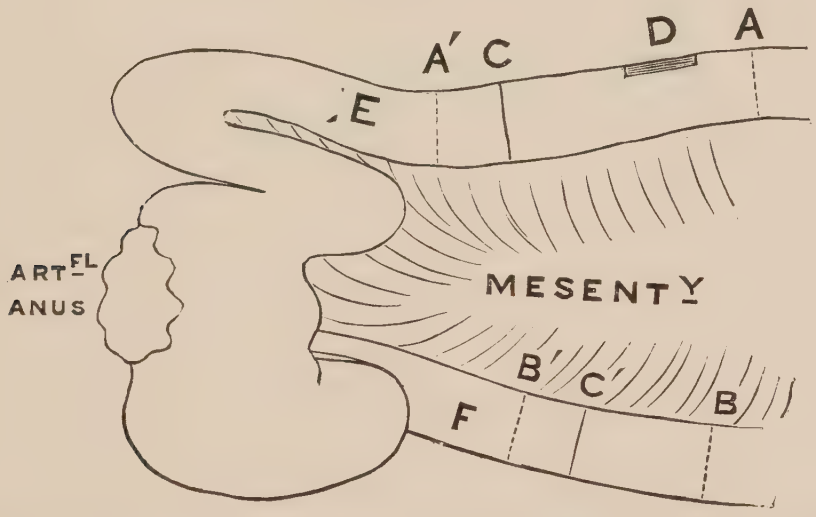


Diagram illustrating Case 1. By mistake it represents a view from below, not from above, as the Intestine was actually seen during operation. In other words, the Coil A′ A was to the left side of the Abdomen.

temporary fæcal fistula, which burst out a fortnight after the operation, and was only persuaded to close after long treatment by injections of various kinds, by the electro-cautery, and by a starvation diet, in which the patient was partly fed by peptonised food placed in the blind intestinal pouch, which still exists, and discharges a little mucus or muco-pus—very little—above the pubes. It is admirably adapted for physiological experiment. Ultimately I intend to close it by some plastic procedure. The intestino-rectal fistula was treated by daily rectal injections of alum water and by an occasional electro-cauterisation, and has long ceased to permit fæcal matter to escape, but still

discharges a slight purulent secretion. This is why I postpone the final plastic procedure.

September, 1896.—The patient's temperature is normal, her health is good and she gets about, wearing a truss over the open blind intestinal pouch, which is a part—probably about 10 inches—of the lower end of the ileum.

The operation of intestinal exclusion has been done before in Germany in cases of irremovable cancer, but never before in a case of this nature. It is, of course, the unclosed fistula leading into the rectum which forbids complete excision of the excluded coil.

Case 2. *Excision of a large, freely movable, malignant tumour involving part of the transverse colon, the whole of the splenic flexure, and the descending part of the colon, all the omentum, except a strip round the greater curvature of the stomach, and also a coil of small intestine.*—The first case in which I ever excised intestine within the abdominal cavity (as distinguished from

Fig. 2.

Position of Malignant Tumour involving large part of Colon, Omentum, and a Coil of Small Intestine.

strangulated and gangrenous hernia), was that of a middle-aged man in the West London Hospital, with a large, perfectly movable tumour in the left flank. It proved to be malignant, involving part of the transverse colon, the whole of the splenic flexure, and the descending part of the colon, all the omentum, except a narrow strip round the greater curvature of the stomach and a coil of small intestine. Senn's plates were used. The enterectomy and suturing itself took 16 minutes. Although the patient was in an advanced state of cachexia and anæmia, and was under ether

3½ hours, he suffered very little from the immediate shock. He was not permitted to lose any blood; everything was clamped before division, and he was most carefully kept warm. His after-pain was, however, great and continuous, and he died 24 hours after the operation. Patients suffering from advanced cancerous cachexia may, as Mr. Rickard Lloyd has pointed out, stand a carefully-conducted long operation well, but fail under the demands made on their strength during recovery, perhaps because the heart muscles are as much degenerated as the voluntary

FIG. 3.

Diagram of the Tumour itself in Case 2. ST., Stomach. OMM., Omentum. T.C., Transverse Colon. S.I., Small Intestiue. D.C., Descending Colon. S.F., Sigmoid Flexure.

muscles. Mr. Ballance, Mr. Edwards, and Mr. Paget assisted in this case on January 7th, 1890. The only analogous one I know of is that in which von Bergmann removed the pylorus and portions of the attached intestines, the operation lasting 4½ hours, and the patient dying 3 hours after it.

CASE 3. *Enterectomy for sarcoma near the ileo-cæcal valve; removal of a large retro-peritoneal glandular round-celled sarcoma*

from the same patient; recovery; recurrence of glandular tumour and consequent death.—The patient, a girl aged 13, was delicate looking, with dark rims under the eyes, and anæmic, and she suffered from pain associated with tumours in the right half of the abdomen, and from symptoms of recurrent partial obstruction, with occasional vomiting. Once a little blood passed per rectum. She was a patient of Dr. Wm. Keen, of Chelsea, and was seen by me, and admitted into the West London Hospital for operation, on February 19th, 1894. Her condition at that time was as follows:—Two distinct, more or less rounded tumours were palpable in the right abdomen, one just to the right of, and

Fig. 4.

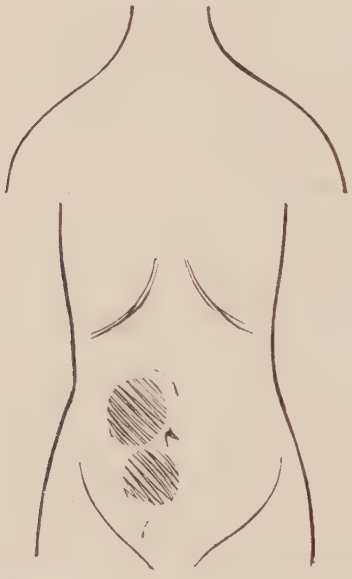


Diagram illustrating Position of Tumours in Case 3.

above, the umbilicus; the other between the umbilicus and the right Poupart's ligament. The percussion note over both was comparatively dull, and there was some tenderness. The urine was acid, of specific gravity 1020, and turbid, containing a deposit of phosphates, but no albumen. She had been ill for a year, and a lump was noticed five months ago. It had several times seemed to disappear. She had been in bed for the last month. Pain was experienced when walking and about an hour after food. The bowels opened regularly. Cardiac dulness was noted up to third interspace and in the middle of sternum. The apex beat was in the fifth space (?) in the nipple line. The first sound at apex was rough and prolonged. There was a mitral

systolic murmur, and a pre-systolic thrill. There was also a double aortic murmur. She had never had rheumatic fever. On the 22nd the tongue was somewhat dry, and there was a faint trace of albumen in the urine. On the 23rd the operation took place, which lasted two and a quarter hours. Light anæsthesia was induced by Mr. Lloyd. The upper tumour being found movable, an incision four and a half inches long was made so as to command both this and the lower tumour—*i.e.*, perpendicularly near the linea semilunaris, and reaching upwards to just above the level of the umbilicus. The abdominal wall was quickly cut through and the tumour and omentum presented immediately. The tumour was obviously inside the ascending colon. The latter was incised longitudinally, when the tumour was seen as a firm, irregular, congested, fleshy mass smeared with fæcal matter. Its surface had a mucous membrane-like aspect. It was about the size of an orange, its base of attachment being wide. During the rest of the operation, Dr. Joseph Wilks, house surgeon, who was assisting, gave his undivided attention to preventing contamination of the peritoneal cavity, and, having cleaned the tumour, I raised it and with scissors cut through the now stretched intestinal wall which formed its base of attachment all round. The small intestine (intussusceptum) was then seen entering the tumour. This being clamped with a pair of large forceps was cut through, and a few more touches of the scissors permitted the mass to come away. There were now, of course, two apertures in the ascending colon. As the one last made, *i.e.*, by cutting round the base of the attachment of the tumour, was much larger than the calibre of the small intestine, the latter was sutured only to the lower part of it by interrupted sutures, and the rest was closed by a continuous suture. The peritoneum was not included in these sutures, which were, of course, inserted from within. The original incision in the large intestine — viz., that through which the tumour had been delivered—was closed (1) by continuous suture of the mucous membrane; and (2) Lembert's sutures of the peritoneal and muscular coat. A row of Lembert's sutures was also inserted into the peritoneal aspect of the junction between the small and the large intestines. The sutures were all of silk, very fine for the peritoneal and of medium thickness for the mucous side. The retro-peritoneal tumour, about the size of a rather large orange,

and doubtless glandular, was left to be removed when the patient had recovered sufficiently. A rubber drainage tube was inserted through an aperture made in the right flank, and a glass tube through one in the linea alba above the pubes. In spite of her anæmic and emaciated state she soon rallied from the anæsthesia and the operation.

The notes of the after-course of the case, kept with the greatest care and ability by Dr. Wilks, are exceedingly full, minute, and valuable, and no abstract can do justice to the picture they present. The temperature usually varied between 98° and 99° F. On the fifth, sixteenth, and thirty-first days, it rose to 100·5°, 100·8°, and 102° respectively, and on the evening of operation it sank to 97°. The pulse was, during the first week, from 132 to 140, during the second from 100 to 116, and then sank to between 90 and 100. The bowels were opened nearly every day, frequently twice or thrice a day in the first three weeks, and even six times on the fifth day. I suspect that the sutures caused intestinal irritation, as after the larger ones came away on the fourteenth and eighteenth days, the stools soon grew less frequent. Blood-stained fluid was removed from the glass pelvic drain for the first three days at frequent intervals, and afterwards serous fluid. Very little pain occurred during the first day or two, but the tongue was rather dry and the face had a pinched aspect. On the fourth day she was not so well. There was a white fur on the tongue. Turbid yellowish fluid came from the pelvic drain. The abdomen was tender and distended and the knees were flexed. On the next day (the fifth) at 4 A.M. she vomited. A rubber tube was substituted for the glass one, and (on the fourth day) she was fed by nutrient enemata, and only an effervescing mixture and peppermint water were given by the mouth. She soon improved. On the eighth and several succeeding days the sinus occupied by the pelvic drain was very gently irrigated with warm saline solution. Vomiting and retching recurred occasionally, therefore on the tenth day all food by the mouth was stopped, except Valentine's meat-juice, diluted, one ounce every four hours. The vomiting soon ceased, and her condition improved. For some days she had only the diluted meat-juice by the mouth, and beef-tea per rectum. On the sixteenth day the enemata were discontinued, and two eggs with two thin slices of bread and butter allowed

Next day (the 17th) there were signs of suppuration beneath the wounds, and they were examined. Pus was washed out with the warm saline solution, and iodoform powder inserted. At night there was a discharge of pus and of "a thick semi-solid substance like hard-boiled yolk of egg." On the eighteenth day she was allowed minced chicken. It was on that day that the sutures began to be discharged per anum. The threatened danger of fæcal fistula (?) passed off immediately. A fæcal smell in the discharge was noticed only on one day. On the twentieth day there was no discharge, and the drainage-tube, which had already been shortened, was discontinued. She was now free from pain and on ordinary diet. The tongue was clean, the appetite was good, she "felt well," and the temperature was normal. Unfortunately, however, the glandular tumour had greatly increased, and extended now on the left as far as the median line, and upwards nearly to the umbilicus. This was operated on on March 30th, five weeks after the enterectomy (a week's delay being due to an accidental rise of temperature on March 20th, probably due to confined bowels). The following are Dr. Wilks' notes:—

On March 30th, 1894, operation under ether was performed by Mr. Keetley, anæsthesia being first obtained by chloroform. An incision nearly six inches in length was made just to the right side of the umbilicus, its upper extremity being a little above that point. On cutting through the abdominal wall, and after the stopping of all bleeding points, the peritoneum was exposed. It was thickened and adherent. The tumour felt cystic, and an aspirating needle was put in, but no fluid escaped. The peritoneum was opened and the tumour exposed, when it was found to have very firm adhesions to a large area of the abdominal wall (from the umbilicus to Poupart's ligament) and also to the great omentum, which was itself greatly thickened either by inflammation or by extension of the growth. These adhesions were partly torn and partly cut after being clamped with artery forceps. The tumour was also as far as possible enucleated with the finger, but owing to the toughness of the adhesions the scissors also had to be repeatedly used. The intestines gave very little trouble, many coils being collapsed. The close relationship of the tumour to the right ureter, to the right iliac vessels, and to the line of union of the intestinal suture done five weeks ago was a greater

source of anxiety. Besides the tumour itself, a considerable quantity of diseased omentum was removed. No ligatures were applied, but the bleeding was stopped by forcipressure or by twisting. The site after the removal of the tumour formed a large cavity, the walls of which tended to bleed at many points in spite of sponge pressure. It was packed with strips of iodoform gauze moistened with weak sublimate solution. No drainage-tubes were inserted. The incision was closed—all but a small portion for strips to project—by silkworm-gut sutures. Iodoform gauze and wood-wool pads were applied. The removal of the tumour occupied 35 minutes, and the whole operation 55 minutes. The patient was a little collapsed after the removal of the tumour, but soon recovered. At 11 P.M. she had vomited several times since the operation; she was in considerable pain. The pulse was regular, 108, and fairly good. The temperature at 6 P.M. was 97·2 F. There was no sign of any hæmorrhage. At 11 P.M. the temperature was 96·8°. At 3 P.M. the gauze packing was removed from the cavity left by the excision of the tumour; there was no discharge. She was in considerable pain. There was no vomiting during the day. The temperature was 101·6°. On April 1st there was no pain, and she slept well; the pulse was 160, and the temperature 102·8°. On April 2nd the pulse was 132, and the temperature 100·4°; a natural semi-solid motion was passed. On April 3rd some epistaxis occurred. On April 4th the temperature was 99·4°; there was no pain or tenderness; the wound was dressed and the whole condition was very good. On April 6th, at 12.45 A.M., there was a fæcal discharge from the wound; but a formed stool was passed per anum, and the general condition was very good. The temperature in the morning was 98°, and in the evening 99°. On April 7th the old wound (for removal of intestinal tumour) re-opened; and there was a fæcal discharge from it. On April 8th a slough was seen in the re-opened wound. On April 10th this slough was removed.

The patient continued to feel well and look better. The wound of the last operation closed quickly; but the wound of the original operation continued open as a fæcal fistula, and water could be syringed through it from the anus. The fistula, therefore, certainly led into the colon. As the fæcal fistula did not form till six weeks after the enterectomy, and as a slough came away

11 days after the glandular tumour was removed, I think that the necessarily free division of the vessels going to and from the intestine in removing the large and adherent retroperitoneal tumour had caused the intestine to slough after it had quite recovered from the enterectomy. Indeed, the second operation was practically an *ante-mortem* examination which demonstrated the success of the enterectomy. The patient went home. The glandular tumour (a round-celled sarcoma) soon recurred, and grew to an enormous size, distending the abdomen and pushing forward the anterior abdominal wall. The tumour was not painful, and there was no fever. Solid motions were occasionally passed per rectum, although the fæcal fistula continued open. Patient at first gained flesh a little, and then gradually emaciated. Occasionally she had attacks of vomiting, and at last she died. There was no necropsy.

Remarks.—In the two cases which recovered from the enterectomy and intestinal exclusion respectively a fæcal fistula formed and kept open for a long time in the one in which Maunsell's operation was performed precisely, and threatened to form in what was a modified Maunsell's operation—namely, suture of the inner coats from within and of the peritoneal coat from without. In Case 1 the open intestinal pouch proved useful for peptonised feeding by the rectum, when the patient was starved while the fistula was being persuaded to close with the electro-cautery, &c. The actual suturing occupied only a small part of the above long operations — not more than a seventh of the time in the longest one. I would deprecate the constant recommendation of speed in operating on these cases. What should be recommended are economy of blood and warmth, careful and correct apposition of parts, insertion and tying of sutures, and strict antisepsis. Speed in all kinds of operations comes spontaneously with practice. By inculcating speed one may produce hurry—the worst element of all in a delicate procedure; but dawdling and pauses for idle consultation may be freely condemned. I recommend (1) a clock staring the operator in the face; (2) thinking out the possible turns and requirements of the operation before beginning; and (3) a thorough understanding between operator and anæsthetist, and occasional brief intercommunication between them as to the patient's state. The first case illustrates the advantages of

thoroughness in dealing with pelvic abscesses. When a pelvic abscess has burrowed extensively, mere drainage is apt to lead only to exhaustion from hectic, whether or not the case be septic in origin. With regard to material for intestinal suture, upon the whole I think silkworm gut too stiff, and would prefer fine silk. In Case 3 the glandular tumour appears to have been discovered before the prime mischief. This occurred in another patient of mine, and shows how difficult it is to get these cases early enough for thoroughly radical operation. It was striking how little the advanced cardiac mischief in Case 3 interfered with the power of undergoing the severe operation and rapidly recovering from it.

A SERIES OF CASES OF INTESTINAL RESECTION.

By Herbert W. Allingham, F.R.C.S.

In this paper will be recorded all the cases in which I have resected portions of the intestines, although the results, as will be seen, are not as satisfactory as one could wish; still, I feel that only by narrating both successful and unsuccessful cases, is it possible to arrive at any definite conclusion as to the correct way of treating cases of this kind under the various conditions which they may present. After narrating the cases, I shall discuss them and endeavour to indicate the procedure which I shall adopt in the future.

Case 1. *Resection of stricture of the sigmoid flexure.**—In October, 1892, I saw, in consultation with Dr. William Neale, Mrs. S., aged 54. The patient had always been subject to constipation, especially during the last year. For six weeks the bowels had ceased to act, and for a month before that they had acted with difficulty. Purgatives and enemata only caused the occasional passage of a little flatus, and one liquid motion. She had never passed blood or slime.

When we saw her she had vomited for some days. The abdomen was greatly distended. There was no growth to be felt, and an examination *per rectum* revealed nothing.

As the length of time of the obstruction seemed to indicate that the stricture was low down in the large intestine, it was agreed to make an incision in the left inguinal region for the purpose of examining the colon and opening it, if it was distended.

* A full report of this case appeared in the 'Clinical Society's Transactions' for 1893.

I made an incision three inches long about an inch inside the left antero-superior spine of the ilium, opened the peritoneal cavity, and found that the large intestine was greatly distended. The gut was brought up to the inguinal opening, and when the hand was inserted into the peritoneal cavity a mass was felt in Douglas's pouch. This was brought to the inguinal opening, and was found to be a malignant growth in the sigmoid flexure. This growth and about fourteen inches of the gut were pulled through the inguinal incision, the parietal peritoneum was stitched to the skin all round the abdominal incision, and the mass of sigmoid flexure and growth was fixed outside the belly wall. The gut was then opened above the cancerous mass, but, as no fæces passed away, the intestine had to be opened below the growth, and fæces were at once discharged. A Paul's tube was inserted, and was kept there for three days.

Ten days after the operation the mass of gut and the growth were clamped and cut away, the mass removed weighing ten and a half ounces. In a month's time the patient was quite recovered, the bowels acting daily from the inguinal opening. I have seen this patient lately and advised that the artificial anus be resected, and a cure effected. She said that she was so comfortable with the colotomy that she did not feel inclined to run any further risk.

Case 2. *Resection of stricture of descending colon.**—William C., aged 30, was admitted into the Great Northern Hospital, January 9th, 1893. No family history of cancer or phthisis—never had typhoid or resided in any foreign parts. For the last two years had suffered from constipation, and about six months prior to this attack had had abdominal obstruction lasting for about a week, relieved by purgatives and enemata.

For the last ten days before admission he had not had an action of the bowels. On admission the abdomen was greatly distended, no tumour to be felt; nothing had passed by the rectum even after repeated enemata; no rectal stricture. On January 11th the abdomen was opened in the middle line below the umbilicus, and the cæcum and small intestines were found to be enormously distended. The intestines were so stretched that I was afraid very carefully to explore the abdominal cavity for fear of bursting the guts. Accordingly, the cæcum was well drawn into the wound into the belly-wall, opened, and a quantity of fæcal matter came away. When more than two quarts of liquid fæces had escaped, the opening in the cæcum was closed with pressure forceps. The cæcum was then thoroughly washed and returned into the abdomen, and the part of the cæcum around the clip on the opening was carefully sutured to the edges of the abdominal wound about its lower part.

The next day, as the cæcum seemed well glued up to the belly-wall, and the cavity thoroughly blocked off by lymph, the clip on the opening in the cæcum was removed. From this time the patient made an uninterrupted recovery, the bowels acting daily by the artificial anus, nothing whatever passing by the rectum. On May 29th he returned to the hospital greatly improved in health; he was fat, and looking well. The bowels acted daily by the artificial anus, in fact, the fæces were constantly running away.

* This case was published in full in the 'Medical Society's Transactions' for 1894.

On May 31st I made an incision five inches long along the left linea semilunaris, meaning to hunt carefully through the sigmoid flexure and all the colon to find the cause of the obstruction, and remove it if possible. I introduced my hand, and commenced by passing the sigmoid flexure through my fingers. This being normal, I continued my search up the descending colon, and about its centre found a hard tight stricture. The gut above and below the stricture was secured by india-rubber tubes passed through the mesentery. A large piece of the gut and the stricture between the tubes (about four inches in length) was then excised. The proximal and distal openings in the gut were carefully joined over a Mayo Robson's bobbin, the mucous membrane of the intestines being first sutured together as described by Mayo Robson by silk sutures, and lastly, the serous surfaces of the gut united with Lembert's sutures.

The patient recovered without interruption from this resection, and on June 14th I closed the opening in the cæcum.

On 21st of June the wound in the cæcum was healed, the bowels acting by the rectum.

The patient remained in perfect health until September 18th, when he returned to the hospital complaining of pain in the abdomen, and of being sick. The abdomen was distended. As after several doses of castor oil and injections he was no better, on September 24th I determined to explore again the part where the stricture had been resected, thinking that perhaps the gut had contracted at the seat of resection. Accordingly, an incision was made parallel to the one about the left linea semilunaris, but a little inside it. When the abdomen was opened, it was found that the peritoneum was studded with hard nodules, and that there were masses in the walls of the small intestines, and great thickening and nodulation of the mesentery generally. The part where the resection was done was perfect—no stricture or contraction whatever. The patient recovered from operation, and stayed in the hospital until October 13th. He was taken to his home at Southampton, and was placed under the care of Dr. Robert Walch, to whom I am greatly indebted for the *post-mortem* examination and the specimens. The patient died on November 9th, ten months after the first operation.

Case 3. *Resection of inguinal artificial anus.**—A woman, aged 48, came under the care of my colleague, Dr. C. E. Beevor, at the Great Northern Hospital, on March 8th, 1894. About three months before, she was suddenly seized with pains in the abdomen after a cup of tea, and was treated for dyspepsia. Ever since that attack she had had violent abdominal pains from time to time. A fortnight ago, she noticed her abdomen swollen. She had been sick several times the last fortnight, and had constant griping pains about the abdomen. On her admission to hospital the abdomen was found to be considerably distended, principally over the lower part. Deep palpitation excited peristaltic action, and the distended coils of intestines stood out very distinctly through the abdominal wall. Per rectum and vaginam nothing abnormal was to be felt. On March 10th, at the request of Dr. Beevor, I saw her, and, concluding from the history that there was some obstruction in the large intestine, decided to open the abdomen in the left inguinal region. This

* This case was published in full in 'The Lancet,' June 23rd, 1894.

I did, and found the sigmoid flexture greatly distended. Before, however, fixing it to the abdominal wall and opening it, I determined to explore the abdomen with the hand in order to (if possible) find out the nature of the stricture. Accordingly, the inguinal incision was slightly enlarged, and then the hand was passed into the abdomen, the pelvis being thoroughly explored. To my surprise no growth or band could be found about the intestine in the pelvis. Accordingly the search was pursued along the descending and transverse colon ; there, again, nothing was found. The sigmoid flexure being so distended, I thought I might have overlooked some band in the pelvis, or that the distension and symptoms were due to an over-distended, and so paralysed, gut. Presuming this to be the case, the large gut was fixed to the incision and opened. A Paul's tube was inserted into the gut. The next morning, March 11th, nothing had passed through the Paul's tube. Accordingly I decided to open the abdomen on the right side over the cæcum. This was done by a vertical incision about the right linea semilunaris. The cæcum was found to be greatly distended. I passed my hand into the abdomen and explored the cæcum and the ascending and transverse colon, but was unable to find any cause for the obstruction. Here again, as on the left side, the large gut was found to be distended. This being the case, I determined not to be misled again by the distended appearance of the large gut, so resolved to investigate the small intestine. The small intestine was traced upwards, and at about the juncture of the jejunum with the ileum, were found two coils of gut firmly adherent to one another to the extent of about two inches. The adhesions were firm and old, and it was with great difficulty that one loop was separated from the other. When the coils were separated, in one was found a stricture about half an inch broad at the part where it had been adherent to the other coil. This stricture was treated by enteroplasty. The patient recovered, and all the motions passed by the inguinal colotomy opening. The spur about the colotomy opening, being well formed, prevented any motion passing beyond it and so on to the rectum. The spur about the opening began to get more prominent, in spite of an attempt to reduce it by pressure with the finger daily. This being the case, it appeared to me useless to attempt any plastic operation to close the artificial anus. On April 16th the patient was put under chloroform. The skin around the artificial anus was divided and the peritoneum opened, and the gut pulled well out of the abdomen. The sigmoid flexure having a fairly long mesentery, it was easily drawn out of the abdomen. Two drainage-tubes were passed through the mesentery and secured with clip-forceps around the gut, about three inches above and below the artificial anus. Above four inches of the gut, with the anal opening, were then cut away. Then a Mayo Robson's bobbin was inserted between the ends of the divided gut, and the gut united over it in the usual manner. On the 27th, some glutinous material was seen in the motions (bobbin ?). She was seen again lately, July, 1895, and she was quite well in every respect.

Case 4. *Resection of stricture of sigmoid flexure.*—I saw, with Dr. Tyson, a Mr. G——, aged 67, who gave the following history. He had always suffered from constipation, but for the last six months his trouble had become much worse, the bowels never acting without strong purgatives. It was not uncommon for him to go a fortnight or longer without an action ; there was no history of cancer. He had lost flesh, and at times suffered from severe colic pains. Upon examination, the

abdomen was rather distended, having a doughy feel. There was dulness along the course of the large intestine, and about the sigmoid flexure there was a hardish mass rather tender to the touch. An examination per rectum revealed nothing.

An inspection of fæces, passed after a strong purge, showed them to be liquid and offensive, but not containing blood or slime. After having him under observation for about 10 days, and trying the effect of purgatives, belladonna, &c., without any result, on May 15th, 1894, I opened the abdomen on the left side, the centre of the incision being about an inch from the left anterior-superior spine of the ilium. On opening the abdomen there was found at the upper part of the sigmoid flexure a hard, annular, malignant stricture. The intestines above the stricture were distended with doughy fæces. As the mesentery appeared to be full of malignant fæces, and there was no evidence of enlargement of glands about the abdomen, I decided to resect the stricture. Drainage-tubes were passed through the mesentery, so as to constrict the intestine above and below the stricture, which was then removed. The ends of the gut were then united by Maunsell's method. The gut was washed and returned into the abdomen, and the abdominal wound was closed in the usual way. There was no sickness; the temperature that night was 102°, the patient slept, and he passed water, the pulse was 88; the abdomen was not distended or tender.

On May 16th he had had a good night; the pulse was 84, the tongue was moist, the temperature 99·2°; there was no pain whatever, and the facial aspect was good.

On May 17th, in the morning the report was that he had had a good night, the temperature was 99°, there was no pain, the pulse was 88, the tongue was moist, there was no tenderness or distension about the abdomen; at 10.30 a.m. the patient said that he felt rumbling about his stomach, and described a sudden burst of wind, accompanied with great pain in the abdomen. The pulse became rapid, the aspect changed, the abdomen soon became tympanitic and tender, and he died late that night. Evidently some of the stitches gave way.

Case 5. *Resection of stricture of ascending colon.*—John R., aged 66, was admitted into the Great Northern Hospital. Three months previously he had diarrhœa and pains in the abdomen. The pain had continued more or less ever since. For the last 14 days he had been constipated and the pain was growing much worse.

On admission the abdomen was distended and tense, with marked peristaltic contractions and great griping abdominal pain.

As I thought from the history of diarrhœa that the stricture might be low down in the large intestine, on May 23rd, 1894, an incision was made in the left inguinal region. On introducing the hand into the abdomen, the sigmoid flexure, descending and transverse colons were found to be empty. A hard mass was felt in the ascending colon. Accordingly the left inguinal abdominal opening was closed, the patient was turned over on to his left side, and an incision was made for right lumbar colotomy. The ascending colon was found and drawn out of the wound and towards its upper part was a hard, localised growth. This was drawn out of the wound, the bowel clamped above and below, and the growth resected. The distal end of the colon was closed and stitched to the end of the wound. The proximal end was left open and a Paul's tube was fixed in it. The bowel was stitched to the edge of the wound.

The patient made an uninterrupted recovery, the bowels acting daily from the lumbar opening. On June 20th I opened the abdomen in the middle line and anastomosed the transverse colon to the ileum about 13 inches from the cæcum with a Mayo Robson's bobbin. By thus anastomosing the small intestine to the transverse colon, I hoped that I should, at a later date, be able to close the right lumbar opening. The patient recovered from this operation, some of the fæces passing from the lumbar opening, others passing down to the rectum.

On September 26th an endeavour was made to close the colotomy opening, an incision being made round the colotomy opening, including the edge of the skin about half an inch in breadth, and the gut was freed al round with some difficulty and was well drawn out of the lumbar wound. The end of the gut, including the skin, was cut off. The end of the gut was next firmly sutured up, and its peritoneal surfaces were brought into contact by Lembert's sutures. The skin edges were then united, the blind end of the gut being left near the surface, so that if leaking took place, the fæces might find their way outside the belly.

On October 2nd, I was sorry to notice that the lumbar wound had broken down and that some fæces were leaking. This leaking continued, some of the fæces escaping by this opening, and others passing by the rectum.

He was kept in the hospital till January 25th, 1895. The opening in the lumbar region had contracted up to quite a small fistula, but some fæces still escaped by that orifice. He was then discharged, his general health being good. I have not heard of him since.

Case 6. *Resection of stricture of transverse colon.*—Jane S., aged 56, was admitted, on October 18th, 1894, into the Great Northern Hospital. She was extremely ill, and from what we could gather she had had for a long time great trouble in getting the bowels to act. For the last month they had acted only on three occasions, and then with very small motions.

On examination the abdomen was greatly distended, there was dulness all along the ascending colon, but the descending colon and sigmoid flexure appeared to be empty. An incision, therefore, was made at once, about the umbilicus. On the abdomen being opened, it was seen that the intestines were enormously distended and that the transverse colon presented. This was empty, and on passing it through one's fingers and examining towards the ascending colon, I found, towards its hepatic end, a hard, tight, annular malignant stricture. The abdominal wound was then enlarged upwards, so as to give a good view of the stricture, and as the disease was found to be so limited in its extent, and the stricture small, I determined to resect. This was done with difficulty, on account of the distension, the ends of the bowel being brought together over Mayo Robson's bobbin. In putting in the additional Lembert's sutures, it was discovered that the peritoneum about the distended portion of the intestine was extremely rotten, so that the stitches had a tendency to tear through.

The patient died 30 hours afterwards, and never appeared to recover from the shock of the operation upon one so seriously ill.

The *post-mortem* showed that there was no leaking about the bobbin, but the intestines were so enormously distended as to seem to have been unable to empty themselves.

Case 7. *Resection of stricture of sigmoid flexure.*—Miss R., aged 56, had always had good health, but for the last eight months had great

difficulty in getting the bowels to act. Of late the bowels never acted without purgatives, and when these were administered they occasioned griping pains in the abdomen, and the patient described that there was a feeling of stoppage about the sigmoid region. When I saw her, the bowels had not acted for about 10 days. About the large intestine could be felt hard scybalous masses, and there was a hardish tender mass to be made out in the left iliac fossa. On examination per rectum, nothing abnormal was to be noted. Injections and medicines failing to relieve the obstruction, on October 21st, 1894, on opening the abdomen by an incision five inches long, and introducing the hand into the interior of the large intestine, commencing at the lower part of the sigmoid flexure, and tracing it through my hand, I discovered, about the middle of it, a hard, annular, malignant stricture. The intestines above the stricture were filled with old, scybalous masses.

As this seemed to be a very favourable case for excision of the stricture, with india-rubber drainage tubes above and below, I resected the stricture, and a V-shaped piece of the mesentery, and brought the ends of the gut together over a large-sized Mayo Robson's bobbin.

After the operation the patient complained of a good deal of pain and was slightly sick. The abdomen was in no way distended. On the 22nd the patient was reported to have had a fair night, the pulse was 100, the temperature 99°, the aspect was good, there was no distension or tenderness, flatus had been passed.

On the 23rd the patient was said to have had griping pains in the stomach, temperature was 99·6°, the abdomen was not distended, and she passed a quantity of wind.

On the 24th she had had more pain in the abdomen over the seat of the operation, and the abdomen was rather tender about that part. Temperature was 101°, the aspect was not so good.

On the 25th the patient had had a bad night, with great pain about the seat of the wound, the temperature had fallen, there was no general distension in the abdomen, and the pain was confined to the left iliac fossa. I therefore took out two skin stitches and passed a probe down towards the seat of the union of the gut. This allowed a little gas and some serous fluid to exude. I did this in the hope that had any of the suturing given way (which evidently was the case) flatus or fæces might pass through the abdominal wound rather than into the general peritoneal cavity.

On the 26th she had had a better night and seemed to be relieved by what had been done. She said she felt as if her bowels wished to act, and on examining the rectum, I found the bobbin there and some hardened masses of fæces. Some flatus had passed by the abdominal wound. About the middle of the day she complained of sudden pain in the abdomen, became collapsed, and soon died. I have no doubt that this was due to some other part of the suturing in the gut having given way into the peritoneal cavity.

Case 8. *Resection of stricture of the sigmoid flexure.*—Harriet T., aged 34, was admitted into the Great Northern Hospital under the care of my colleague, Dr. C. E. Beevor. She gave the following history. For about eight months she had been troubled with her bowels, at first by diarrhœa, but for the last two months with constipation together with frequent attacks of colic pains and occasional vomiting. Various drugs were given in the attempt to relieve her, but with little or no result ; on

some hardness being discovered in the left inguinal region, Dr. Beevor asked me to see the patient with him. I observed the abdomen to be somewhat distended, any manipulation of the abdomen caused peristaltic action of the intestines, and in the left inguinal region could be felt a hard, irregular mass.

As the patient was getting worse, on January 30th, 1895, I opened the abdomen by a curved incision in the left inguinal region, and on exposing the sigmoid flexure, noted a hard, annular, malignant stricture involving the gut. This was resected, and the ends of the intestine were approximated by Murphy's button. The next day the patient appeared to be fairly comfortable, some flatus had been passed by the rectum, the abdomen was in no degree tender, and the temperature was good.

On February 1st the patient began to get somewhat distended, so a small turpentine enema was given, but with no result. There was no tenderness about the abdomen, and the aspect was good. On February 2nd, as the distension was increasing, another turpentine enema was given, and repeated doses of sulphate of soda administered ; there was still no result. On February 3rd, as this state of things continued, the patient died, complaining a few hours before death of great pain in the abdomen.

At the *post-mortem* it was seen that at one part of the gut the intestine had sloughed, and there was some extravasation of fæces into the peritoneal cavity. The intestine above the button was greatly distended, and the hole through the button was absolutely blocked by a hard mass of fæces.

Case 9. *Resection of stricture of the small intestine.*—Ellen H., aged 44, was admitted into the Great Northern Hospital with the following history. For twelve years she had an umbilical hernia which became strangulated and remained strangulated for five days before it had been operated upon. Fourteen days after the operation, fæces commenced to come through the abdominal incision, and had done so ever since. The bowels also acted occasionally per rectum. Since the operation she had been subject to continued griping pains in the belly.

On admission, the abdomen was flaccid, and occasional peristaltic action of the intestines could be perceived through the abdominal wall. Situated in the position of the operation-wound, about the umbilicus, were two small openings through which came liquid intestinal contents.

The patient was well purged every day for a week prior to the operation, which I performed on April 24th, 1895.

An incision was made five or six inches long, just to the right of the middle line, the fæcal fistula being about the centre. A probe was passed through the fistula previous to the incision. Having cut through the abdominal wall, and the peritoneal cavity being opened, I found that the intestines, both large and small, were extensively netted together about the umbilicus. Situated in one part of the small intestine was discovered a very tight stricture, the proximal end of this part of the intestine was considerably dilated, the distal end quite collapsed.

Great difficulty was experienced in separating the adherent coils one from the other, and in doing this in several places rents were made in the intestines. These rents were immediately closed by a continuous suture uniting the mucous surfaces, the serous surfaces being brought together by Lembert's sutures. When the intestines were separated one from the other, attention was then turned to the strictured small intestine. The strictured gut was brought well out of the abdomen, the fibrous stricture

with about an inch of gut on each side was resected, and the fluid contents of the upper distended portion of the gut were allowed to run out into a basin. Then the two ends of the gut from which the stricture had been removed were united over a Mayo Robson's bobbin. The old sinus in the abdominal wall was cut away, and the abdominal incision was brought together with silkworm gut sutures.

It is needless in a successful case to narrate the after-treatment. The patient made an uninterrupted recovery, and left the hospital on May 28th, perfectly cured.

Case 10. *Resection of a piece of the small intestine for large fistula.*—Emily D., aged 18, in Jauuary, 1895, was in the Chelsea Hospital, where she had the abdomen opened and flushed out, and a drainage tube inserted for tubercular peritonitis. A few days after the operation fæces began to come through the abdominal wound, and continued to do so ever since.

There was no tubercular history in the family. The patient was a very thin and hectic-looking girl. There was no evidence of tubercle about the lungs.

On examination of the abdomen it was noticed that midway between the umbilicus and the pubes was an irregular unhealthy-looking wound from which fæces exuded in considerable quantities. At the lower part of the wound, also, was a large sinus, through which pus flowed. This sinus apparently led down towards the pelvis.

Temperature at night was usually about 102°. The bowels acted two or three times through this fistula, and the patient was evidently losing ground.

On June 5th, I explored these sinuses by making two horizontal incisions outwards, which exposed a large abscess cavity dipping right down into the pelvis, and on the floor of the cavity was a piece of small intestine, in which there was a large perforation. The intestine was freed from adhesions, and was noticed to be studded with tubercles. This was then brought well out of the wound, and I resected about two inches of the gut, which contained the perforation. The ends of the gut were then brought together over one of my bobbins, and Lembert's sutures were applied outside. The large abscess running down into the pelvis was then thoroughly scraped out, and the gut with the bobbin was put back into the abdomen. The belly wound was left open so as to allow of thorough drainage.

On June 15th the now decalcified part of my bobbin was passed by the rectum. The next day, just below the seat of enterostomy, a small pinhole opening was observed, from which fæces exuded at times.

The patient was putting on flesh rapidly, and her appetite was good.

From this small opening fæces have ever since exuded. These irritate the wound and the tissues around, and seem to prevent sound healing. Also at times from the large pelvic cavity some pus exudes. Considering the tubercular condition of the intestines, it is a wonder that any union took place over the bobbin. I hope that as the external wound heals and contracts, the small opening into the intestine will eventually close.

It will be seen that I have operated upon ten cases requiring resection, six recovering and four dying.

In four of the cases that recovered, Cases 2, 3, 9, and 10,

the intestines had been emptied prior to the operation of resection.

In the four cases that died, Cases 4, 5, 6, and 8, resection of the diseased portion was done when the intestines were loaded with fæces. From this it will be perceived that distension of the intestines at the time of the resection enormously increases the risk of the operation. The following appears to be the explanation :—When the intestines are distended, large quantities of fæces are pressed down towards the seat of union, and no doubt are constantly disturbing it by the peristalsis they set up. Further, the patient is in a way poisoned by the fæcal accumulation, and when he is in such a state it is easy to understand that union between the divided ends of the intestine may be delayed, or take place in a feeble and even imperfect manner.

To look at the matter in another light :—When the large intestine is dealt with, obstruction has been present for some time, and the fæces are solid or semi-solid. They therefore may press upon the seat of union, or if a bobbin has been used, may block it as in Case 8, or tear it away as in Case 7.

With the small intestine, however, the case is different. For, in this part, however long the obstruction may have existed, the contents are always fluid ; hence there is less danger of the bobbin or button being blocked, or of pressure causing it to break away from its situation.

We may therefore arrive at the following conclusions :—Stricture of the *large* intestine must *not* be resected when the intestine about the stricture is *distended* with fæces. Stricture of the *small* intestine may be resected even when the gut is distended, for the fæces are liquid.

I have therefore modified my methods when dealing with strictures of the large intestine.

The gut, quite close to and just above the stricture, should be fixed into the abdominal wound ; in fact, a colotomy should be performed, so that the intestines, by means of purgatives, may be thoroughly cleared of their contents. When this has been effected, and the patient has recovered in general health, a second operation should be performed, which consists of freeing the artificial anus from its attachment to the belly wall, and resecting it and the stricture in one piece.

Sometimes it may be possible to bring the strictured piece of

gut out through the abdominal wound, and to open the gut on the proximal side of the stricture. In this way the intestines can be thoroughly emptied. About ten days afterwards, the opening in the gut and the stricture can be removed in one piece by applying a strong clamp to the protruding portion of the gut. This is exemplified by Case 1. Some months later the artificial anus may be freed from the belly wall and resected, the ends of the gut being united over a bobbin.

Some surgeons at the time when the artificial anus and stricture are removed, that is to say, about ten days after the first operation, advise that the ends of the divided gut should be united *at once* over a bobbin. This procedure appears to me to be unwise, for, as a rule, a patient requires some weeks, or even months, for thorough recovery, and, until then, the making of an end-to-end union is not safe.

It is now evident to my mind that with these resections, as with all other cases of intestinal anastomosis, the use of some form of button or bobbin is absolutely imperative. These appliances prevent contraction or dilatation of the gut at the seat of union, and there is less likelihood of leakage in the line of suturing. If no bobbin is employed, and Maunsell's method is used, as in Case 4, the seat of suturing is unsupported, and a leak between the sutures may occur.

Another use of a bobbin is to secure the rest for the parts which is necessary for sound healing, for, as with other portions of the body, union is favoured when the divided pieces of intestine are kept fixed and in a state of rest.

In the 'Lancet' for August 31st, 1895, I discussed the other bobbins and bobbins which were designed for use in intestinal surgery, and described a new bobbin of my own, which I used in Case 10.

The PRESIDENT said he was very much interested in this department of surgical practice. To anyone outside surgery these operations on the abdomen were simply marvellous, requiring as they did consummate skill, physiological foresight and ingenious contrivance; indeed it seemed to him that the success and brilliancy of these achievements might sometimes lead to their being prematurely performed, though, of course, this remark could not apply to any of the cases brought before them that evening, in all of which the operation was obviously necessary. The very success of the operations might, however, conceivably deter them from seeking some easier and less drastic means of relieving the particular condition.

The Secretary read the following note, contributed by Mr. Mayo Robson, of Leeds, who was unable to take part in the discussion :— It is almost generally conceded that of the two methods of uniting the intestine after resection, that by some form of apparatus presents certain advantages over the simple suture. I have employed the decalcified bone bobbin in a large number and in a considerable variety of cases, and the success of the operation makes me desire that its advantages should be known. The principle on which the bobbin acts is to afford a support to the suture, or, as Professor Macewen described it, "a splint to the sutured bowel." The bobbin consists of a tube of decalcified bone with a raised rim at each end, the outer margin of the rim being rounded, the inner being vertical: it is made in various sizes, in order to be conveniently employed in any part of the alimentary canal. Messrs. Down Bros., who have made them for me, have kindly sent specimens for inspection. The advantages claimed for its use are—simplicity, facility, rapidity and efficiency. (1) Only one continuous suture need be employed, or, if greater security be thought advisable, two sutures may be used, one to unite the serous surfaces, another the mucous margins. No other sutures are required, hence the operation can be very quickly performed. (2) Tension is avoided, and thus all danger of sloughing of the united margins. (3) A continuous mucous channel is secured and thus there is no tendency to cicatricial contraction. (4) The barrel of the bobbin effectually guards the line of suture so that there is no danger of the contact of septic material and no possibility of intestinal contents escaping. (5) The raised ends of the bobbin prevent it slipping out of place until its work is accomplished. (6) No foreign body is left in the canal as the bone disintegrates in a few days. (7) It is so light that there is no tendency for it to drag the sutured gut down and so to produce kinking of the bowel. (8) It causes no irritation. (9) It is available for any of the ordinary operations, such as enterorrhaphy, enterectomy, enteroplasty, pyloroplasty, pylorectomy, gastro-enterostomy, intestinal anastomosis, &c. (10) It has been frequently used both by myself and by other surgeons and has been proved both safe and efficient.

Mr. Bidwell called attention to a method of intestinal suture which had not been even referred to by the authors, viz., the method recommended by Halsted of Baltimore. This surgeon had shown that the serous and muscular coats were not tough enough to hold sutures; he urged, therefore, that it was absolutely necessary to include a portion of the submucosa in each suture. This, at first thought, might appear difficult, but if a straight needle be used, and it be pushed into the gut wall with the pulp of the finger until some resistance is felt, then in lateralizing the needle a few fibres of the submucous coat will be picked up. This was the fundamental principle of Halsted's suture, though he often heard people describe it as a simple quilt suture. In all sutures of intestine he had used Halsted's stitch in combination with others. With regard to Maunsell's method, he himself had had one very successful case of resection of small intestine, but as this had already been published, he would not refer to it at greater length. In his case, as in one of Mr. Keetley's, there was some fæcal discharge from the wound, and this had led him to the conclusion that Maunsell's method was not absolutely desirable, unless another row of sutures were added; this, however, would make the operation too long. He therefore felt inclined to use Mayo Robson's bobbin in cases of end-to-end anastomosis. If the bobbin were not to hand, then probably Maunsell's method would be the best.

In all these cases, however, he felt sure that experience was the most important factor in success, and surgeons would be most successful in using the particular suture with which they happened to be familiar.

Mr. Bruce Clarke opined that no absolute rule could be laid down as to the particular method of uniting any two pieces of intestine; indeed, the great difficulty, in his experience, in all cases of intestinal obstruction in which removal of a portion of intestine might be called for, was to make out exactly what was the matter. One made an incision and one found an amount of adhesions, a great deal of time being taken up in ascertaining what was the actual condition of the parts. He recalled that two or three years ago he had shown at the Clinical Society the case of a boy with a big hernia on whom an operation had already been performed without procuring relief. When seen, a large portion of his cæcum and portions of large and small intestines were outside the abdomen. On opening the abdomen it took him three-quarters of an hour to make out the exact condition of things, owing to the adhesions left after the previous operation. Finally, he determined to resect a large portion of intestine as this seemed to be the only way to get things right. He had to cut away the whole of the cæcum with several inches of large and small intestine. As to joining the ends of the divided gut, he admitted that he was not partial to artificial appliances, such as bobbins and buttons. The case proved quite successful. He had shown the lad a year later at the Society, and he walked and ran about the room holding his cæcum in his hand. He then presented no trace of hernia and was as strong as any other boy. He pointed out that after cutting the intestine across, the mucous membrane at once protruded from the divided ends, and by means of a continuous suture it was easy to unite the mucous membrane all round, the last stitch being passed into the bowel. Then the ends of the peritoneal and muscular coats required to be united so as to bring large portions of their surfaces into contact. One plan of doing that was by Maunsell's method, and that had proved successful in many hands. In this particular instance he had to fit a piece of small intestine into the large intestine, and this he effected by fixing corresponding portions of the two tubes, just as a tailor fits in a coat-sleeve, or a woman gathers in her dress at the waist. It was quite easy with a little manipulation to pass large into small intestine, or *vice versâ*. A second line of sutures should be used outside to unite the upper to the lower end, by which means one gradually invaginated more and more of the upper end of the gut into the lower. In this case, as was inevitable after such an operation, there was a certain amount of shock, but on the third day the lad was out of danger, and within six weeks he was perfectly well and able to run about the wards. He has also employed this method of suture in a couple of cases of gastro-enterostomy. The latter were not cases in which one expected the patients to survive very long. One of them lived three weeks without fæcal extravasation, and the other somewhat longer. He thought he might therefore claim that so far as the suturing was concerned he had been successful in uniting the two ends; if his plan were employed there must be more than a single row of sutures. He then passed on to discuss the objections to the various forms of bobbin. He pointed out that in several cases brought before them that evening there had been leakage, and he himself knew of two cases in which the button, having got loose in the intestine had caused death by perforation. He believed this had also occurred in other instances, at least, he inferred that to be the case from the discussion on

the subject at the last meeting of the British Medical Association. If one could point to only two such instances, it would show at any rate that Murphy's button was far from being a perfectly satisfactory method of uniting divided intestine. If one wanted to unite organs such as the gall-bladder to intestine some distance away from one another, or if much tension existed, he was quite willing to admit that a bobbin of some kind was useful, but he thought it was a mistake to employ it in a routine manner in all cases.

Mr. Lockwood said that two very clear theses had been placed before the Meeting. Mr. Allingham had said, as regarded the time and circumstances under which intestinal resections and suture should be performed, that no such operation should be attempted when the gut was distended or paralysed. He thought that every surgeon who had had to deal with cases of intestinal obstruction would confirm that view to the fullest extent, and there could be no doubt that it was impolitic, and likely to lead to disastrous results, to attempt to suture distended and probably paralysed intestine. Circumstances would determine what should then be done. In some cases, where enterotomy had been performed, the best plan was to draw out and empty the intestine, and then to perform intestinal suture. But other circumstances would have to be met in the way suggested by Mr. Allingham. The other thesis was, that some form of mechanical appliance was necessary in intestinal suture. His own experience of intestinal resection and suture, like that of many other surgeons, had not been very great. He had twice had an opportunity of performing resection and suture of small intestine, one of intussusception, and one of gangrenous gut, in which he performed the operation described by Mr. Bruce Clarke, which was practically Cerny-Lembert's operation. This could be expeditiously performed, and in one of his own cases it proved very satisfactory. The intussusception case died of peritonitis. With regard to contrivances he did not think they were necessary in dealing with small intestine. The large intestine was, to some extent, accustomed to obstruction by mechanical substances, whereas the small intestine was not. From the cases he had watched he had acquired a strong bias against all mechanical contrivances in intestinal surgery. Mr. Allingham's series of ten cases with six recoveries was brilliant, but in cases in which resection and suture had been performed of gangrenous gut, of which enormous numbers were on record, showed about the same result, though they were performed under much more adverse conditions. He urged that Mr. Allingham had not clearly shown a preponderating measure of success in the use of mechanical contrivances within the intestine. His cases were, however, of the greatest possible value, because they were complete, and he had given a perfectly clear and candid account of his results. Mr. Mayo Robson's observations lost a great deal of their value because, instead of giving them the definite proportion of successes and failures, he had spoken only in general terms of the results in the hands of himself and colleagues. The only way this question could be settled was by comparing series of corresponding cases. With regard to gangrenous gut, they had before them an enormous mass of evidence, because most of them had been done by ordinary suture; but with regard to operations done with mechanical contrivances, similar definite figures were wanting. There was hardly a surgeon but had heard of disasters following their use, and it was impossible to form a definite opinion until they had the cases before them.

Mr. Hutchinson, Junior, referred to a case in which, three years ago, he had resected five inches of small intestine that was gangrenous in a femoral hernia. That patient was at present in excellent health. The operation was done after the method usually employed in such cases, viz., by continuous suture of the mucous membrane, and as many interrupted sutures for the other coats as they could get in. Such a case was satisfactory enough, but he felt bound to say what had happened to him since. In three other cases he had performed resection on gangrenous gut in hernia, and all three proved fatal. One patient evidently died from the giving way of the sutures within two or three days of the operation, and, in that case, he had remarked that the gut, probably part of the ileum, was excessively thin. He doubted whether any mechanical contrivance would have done more in that case. The other two patients lived ten days and a fortnight respectively, and he felt sure the fourth case would have recovered, but for a slight attack of pneumonia afterwards, which caused cough and strain on the sutures. The patient had old phthisical changes in the lungs. Of course, resection for gangrenous gut was done under the most adverse circumstances, and yet one failed to see what other course was open to the surgeon.

Mr. Stanmore Bishop said the present subject was one in which he had always taken a great interest, and he had even contributed some little in the shape of a suture of his own. The mechanical support by means of bobbins or buttons was another instance of the repetition of history: since Denans, in 1826, used three metal rings in a way closely simulating the Murphy button, whilst Neuber, in 1884, used a tube of decalcified bone following the sutura quatuor magistrorum described by Travers, which is almost identical with the bone bobbins shown to-night of Mr. Mayo Robson. Cases should be differentiated, since it was evidently absurd to treat a case of strangulated hernia in the same way as a case where some small intra intestinal tumour had to be removed. Personally, he had seen no case of gangrenous hernia in which primary union would have been justifiable. The state of the patient precluded it. In such cases, he was convinced that resection of gangrenous intestine, omentum and mesentery, with drainage of the gut, was the proper procedure at the time, followed by secondary union when the patient had recovered from the effects of the injury and primary operation. If that were so, the question of bobbin *versus* suture must be reconsidered. The bobbin had appeared advisable, because the idea of celerity had been the dominant note in the surgeon's mind, but if these cases were no longer to be united primarily, but only secondarily, the dominant note would no longer be celerity but security, and the bobbin and button might have to give place once more to some method of suture. Mr. Murphy's button, as at present made, had certain drawbacks. The holes made for drainage were cleanly punched out, and when the segments were in place and made to unite, the fingers almost unconsciously pressed upon these openings, since they slipped over the smooth surface to find some resistance at the edges of these openings. Such edges would of necessity cut the bowel somewhat above and below the line of union, and so lower the vitality of this portion that later it would give way. Such an accident had happened, he believed, in a case of his own. Another drawback had been noticed in some cases mentioned at the British Association Meetings. Owing to the similar weight and size of the two segments, the button had fallen into the proximal segment of the gut, where it had been found

after death. The former accident might be avoided by having the edges of the opening turned in, whilst the latter might be prevented by making the male end of some much lighter metal, such as aluminium, which, by its colour and striking difference in weight would always remind the surgeon that it should be placed in the prœimal segment. Of Mr. Mayo Robson's bobbin he had had no experience, but he was somewhat surprised to find that no mention had been made of Mr. Bowreman Jersett's tubes, which had the advantage of being much more easily introduced, because of their conical form and their ready approximation. He had had good results from their use.

Mr. KEETLEY, in reply, remarked that very little had been said on his cases, the interest having been concentrated on bobbin *versus* suture. He agreed very much with the last speaker, and with what Mr. Bruce Clarke had argued, viz., that the time taken up in the operation was not so important an element as some would have them believe, by having so much to say about speed in this class of operation. He did not believe that in any art the best work could be done by persons who were thinking about speed. Of course, there must not be anything like dawdling, but speed was a thing that came with practice. Nor did a prolonged operation really affect the patient as some surgeons seemed to think. Personally he was not aware of a single case on which he had operated dying because he had taken too long about the operation, though he admitted he had sometimes taken a long time. It was vastly more important to keep the patient warm and prevent undue loss of blood. Of all things likely to render an operation unsuccessful, he thought that hurry towards the end of it was about the worst. With regard to the question of bobbin *versus* suture, he did not think there was any justification for deciding in favour of one or the other. It was like discussing whether it was safer to secure the front door by a lock or a chain, or whether the coat should be fastened with buttons or with hooks and eyes. Among the points calling for attention was the question of fæcal fistulæ. He was formerly under the impression that these were specially frequent after Maunsell's operation, but the same thing had happened in two or three of Mr. Allingham's cases, one of them being permanent. Neither of his own cases had developed permanent fistulæ as the result of suture. One had it a long time afterwards, but that was due to necrosis of the intestinal wall following excision of the retro-peritoneal gland. He remembered the case related by Mr. Bidwell, and he remembered telling him that most likely it would prove to be merely a passing alarm, and so it did. These temporary fistulæ seemed to follow every method of operation. He did not believe that, in most cases, the fæces had escaped at the time it appeared at the surface. He suggested that probably the fæcal abscess had begun with a trivial leakage some days before the operation. One thing to be said against all bobbins was that they were mechanical irritants, and might act as mechanical purgatives in the intestine, but so also might a thick piece of silk, as was illustrated in the first of his cases. The patient was very much purged for some days until the suture came away, and then he became well at once.

Mr. ALLINGHAM, in reply, regretted that the discussion had turned exclusively upon the question of bobbin *versus* suture. He himself had tried sutures in several cases, and he certainly much preferred the bobbin. The operation was much easier to perform, and he thought it must be better for the intestine to be thus kept at rest by the bobbin,

especially the decalcified bone plate, which could not obstruct the intestine later on, like the Murphy button. He was, therefore, in favour of the bobbin, and should continue to use it. With regard to Murphy's button, he had heard of two cases where the patients succumbed to pressure effects of the button. In one case of gastro-enterostomy the button was found in the peritoneal cavity, and, in the other, the intestine had given way where the two parts of the button came together. He himself knew of many such cases. He would, therefore, never use the button again.

November 25th, 1895.

THE OPERATIVE TREATMENT OF CLEFT PALATE.

By Edmund Owen, F.R.C.S. Eng.

It would, I think, be out of place if I made this the occasion of entering into a detailed account of the methods adopted in dealing with the cleft palates of the children whose brief clinical records form the basis of this paper. To do so would be to levy an unfair tax upon time and patience, and, possibly, to deprive me of the opportunity of making remarks upon the operation which might be more generally of interest. The five cases which form the basis of this paper happened to come under notice in my private work during the months of May, June, and July last. In most of them the cleft traversed the hard as well as the soft palate, and they were all dealt with on very much the same plan. In each case Mr. Henry Davis gave chloroform as the anæsthetic, partly by a flannel mask and partly by a Junker apparatus, and Mr. Kellock kindly helped me with the operation. Smith's gag was used, and the child's head was allowed to hang well back over the end of the table so that the blood might make its escape by the nostrils instead of entering the pharynx or larynx. All the children were operated on at the St. Helena Home, next door to Lord's cricket ground, which has the great advantage of being surrounded by a large garden which in some respects answers Bacon's demands as to what a garden should be. He says: "For the side grounds you are to fill them with variety of alleys, private, to give a full shade; some of them wheresoever the sun be. You are to frame some of them likewise for shelter, that,

when the wind blows sharp, you may walk as in a gallery." And, surely, in such an environment as this, primary union is more likely to be obtained than when a child after the operation is shut up in a close ward or a stuffy house. I got the children out into this garden, if possible, on the day after the operation, and they amused themselves on the grass quietly and safely the livelong day. Such an arrangement could be carried out only in the spring and summer, and my experience is that this is by far the best time for operating. East winds, fogs, catarrhs, coughs and colds have then passed away, and, moreover, a good natural light can almost be depended upon for the operation.

When the question of operating upon a cleft palate is being considered, due regard should be paid to the aspect of the child, and careful inquiry should be made as regards the general state of health. The same precautions are, of course, advisable in the case of every operation in which, urgency being out of the question, the surgeon can choose his own time and place. But in the case of operations for cleft palate there is this difference, that if primary union is not secured complete failure is likely to result. If the edges of the palatine cleft do not adhere from the first, the child's tongue and his food find their way between them, and inflammation, ulceration, and suppuration ensue; the stitches cut their way out or adhere uselessly to one side, and the child's mouth is probably left in a worse state than it was before, because the borders of the cleft are henceforward to be represented by firm and unpromising scar tissue. Failure to secure primary union after this operation is far more serious than it is, for example, in the case of the radical treatment of hernia or in the case of a harelip. In the former instance suppuration, though greatly to be regretted, does, as a rule, little more than delay the healing of the wound; and in the case of the harelip, as soon as the inflammatory swelling has subsided, the granulating margins of the labial flaps can be brought together and a secondary union promoted which, in all probability, effects in due course a most excellent result. For a cleft palate operation, then, the child must be in the very pink of condition, and the surroundings should be such that nothing is likely to disturb him. With the object of getting the child to adapt himself to the environment, it is well to have him placed in the charge and under the authority of the trained nurses for a few days before being operated on.

Some children learn their first lessons in obedience in these circumstances.

We do not yet understand how it is that there should be an element of uncertainty in the results of operations for cleft palate. I suppose that my experience is not peculiar in this, that on completing a long, difficult, and unpromising operation, when I have remarked that I must not be too hopeful as to the result, the issue has been perfect; and, on the other hand, when I have prophesied a success for an unusually easy case, Nemesis, the daughter of Nox, has apparently overheard, and has condignly punished me. As to what may be the exact source of the micro-organisms which every now and then undergo successful incubation in the area of the operation, and thereby spoil the surgeon's work, I can say nothing definitely—I suppose that they are staphylococci and streptococci. The operator, however, should take care that he does not introduce any of them with his instruments or sutures, and with this object in view he must have all his material boiled just before using it. And although the delicate mucous membrane of the mouth does not allow of his using the customary carbolic lotion, yet at least he can take good care to have the child's mouth and his own fingers as aseptic as he can possibly get them. As regards the child's mouth, there is much that he can do. Enlarged tonsils and adenoids should be got rid of some weeks beforehand, and carious teeth extracted or efficiently dealt with in other ways. And if just before the day has arrived the tongue be found coated or the breath foul, or if the child be vomiting, purged, or coughing, or the temperature be raised, the operation must be postponed.

It has been remarked that, as regards the healing of wounds, the mouth may be left to take care of itself; and, for the most part, this is true. Taking into account the work of the dental surgeon, there is no region of the body in which so many wounds are daily inflicted as the mouth; and, with all this, how rarely does one hear of either constitutional or local trouble being caused by wounds in the mouth. They all heal quietly, though, for the most part, by granulation; but something better than this is needed after operating on a cleft palate. Not only must the child and the child's mouth be wholesome before the operation is undertaken, but the surroundings must also be favourable. Mischief-seeking germs want no better nidus than that afforded

by the muco-periosteal flaps which have necessarily been injured by the operation on the palate. There they find moisture, warmth, and oxygen. No incubator could afford them a more generous or favourable treatment. If there happen to be such germs floating in the air the wound is more than likely to attract them, and when once there they cannot be dislodged or even controlled. It is well, therefore, as I have already insisted, that the operation should be done in an atmosphere which is as free, fresh, and favouring as possible. I am anxious to hear the opinions of other surgeons in this matter, but my own experience is that cleft palate operations turn out much better in private practice than in hospitals. In hospital work some cases do perfectly well, and then come a series of disappointments, partial or complete. Yet, so far as the surgeon could tell, the one set of cases resembled the others as nearly as, in clinical work, balance and average are obtainable. I think it is a good plan for the surgeon to keep out of sight upon the day of the operation, so that when he subsequently appears upon the scene he may be regarded as a kind and sympathetic friend. In this way he gains the child's confidence and the privilege of looking at the palate whenever he wishes. Not that inspection can do any good. Though, on the other hand, if the child does not object, it can do no harm. As regards the operation in these children, it was begun by paring a slender strip of mucous membrane from each side of the gap from the tip of the uvula to the very front of the cleft. A free incision was then made along the alveolar aspect of the palate, close against the inner borders of the teeth, and the strips of muco-periosteum which were included between these alveolar incisions and the borders of the cleft were carefully detached by raspatories from beneath the palatine arch and shifted inwards to the middle line. The tension was then relieved by severing the aponeurotic attachment of the soft palate to the posterior border of the hard palate, and by extending the alveolar incision backwards as far as seemed necessary through the entire thickness of the soft palate. By this last means the elevators and tensors of the palate and the palato-pharyngei were entirely deprived of injurious influence upon the line of suturing. Though the chief cause of failure of union after operation is probably the incubation of septic micro-organisms, still the risks of the line of suture giving way on account of the child vomiting, crying, or coughing must be reckoned with. Nevertheless, I

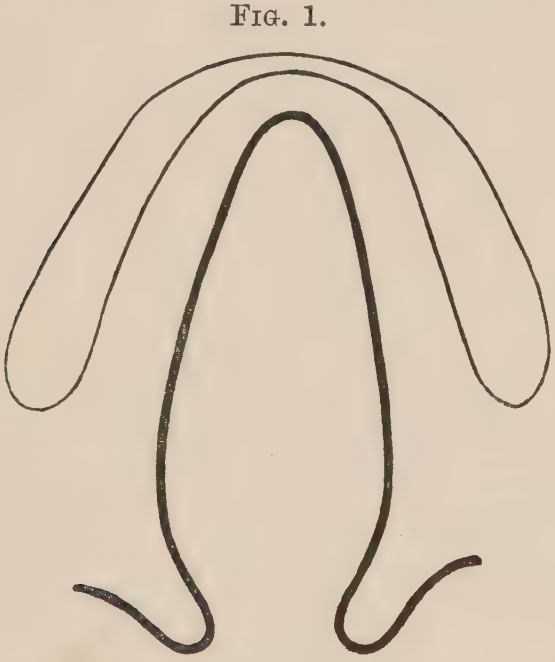
have seen so many cases in which one or more of these direct causes of danger have been present in a marked degree and yet have done no harm, that I am not much alarmed at their occurrence. If the sutures are soundly inserted they ought to hold. That woman would hardly be worthy of the name of "nurse" who allowed the child after operation to stick his finger into the mouth with the hope of clearing away some unknown source of irritation or annoyance. But no one can prevent the child sucking at the wound, or even thrusting the tip of the tongue into the line of sutures. I have, however, adopted a little plan which I think effectually prevents the latter element of danger. It consists in using silver wire sutures somewhat liberally, and, after twisting them up, cutting them so that about one-eighth of an inch of each suture bristles downwards along the middle line like the barbs on the wire in a cattle-fence.

The less the child is disturbed after the operation the better. It is inadvisable to distress or frighten him by giving him food through the nares by a soft tube. If he continues to vomit from the effects of the chloroform, the introduction of food into the stomach will certainly be harmful. The best thing is to darken the room and let the child sleep off the effects of the operation. If he makes signs that he wants something to drink a teaspoonful or two of water may be given. Probably in this way twenty-four hours may be passed over. After this small quantities of beef-jelly may be given in a tea-spoon. The jelly slips down easily and is a clean sort of food. It is far preferable to milk; it does not form curds in the stomach as milk, and it is, I think, more easily absorbed. If, when the feeding is begun, the child will allow the nurse gently to spray or syringe out the mouth into a basin, so much the better. But it is a mistake to attempt such irrigation if it frightens the child. As regards the fluid for irrigation, sanitas and water or a very mild solution of carbolic acid or of Condy's fluid does well. In the course of a day or two a little sweetened orange-juice, chicken or meat which has been run through a fine sieve, bread and milk, or a soft custard pudding may be given.

Case 1. The first case is that of a girl aged 6½ years, who was sent to me by Mr. Morton Smale last May. This was the worst cleft that I ever attempted to close. It extended through the entire hard and soft palate, the widest part of the cleft being seven-eighths of an inch. One of the students of St. Mary's Hospital, Mr. A. W. Sanders, has made an excellent

water-colour drawing of the mouth (a little less than life-size), showing through the cleft the pharyngeal tonsil. Mr. Smale also kindly had a cast of the palate made for me (fig. 1). A week or so before operating I prepared the way by having some carious teeth extracted and by scraping off the pharyngeal tonsil, or, as it is called, the post-nasal adenoids. I also scraped the faucial tonsils. The staphyloraphy was a long and tedious affair, and though we succeeded in getting the edges of the cleft together without undue tension, in a few days the whole thing had broken down from stem to stern. Moreover, the child looked pale and ill, and the palate and naso-pharynx were covered with foul and tenacious mucus. Not a stitch had held, and the cleft appeared as wide as ever, with an unhealthy gap along the inner border of either alveolar process where the lateral incisions were made. There was no sloughing, however. About

FIG. 1.



Cleft of hard and soft palate (actual size).

ten days after the operation, when the wounds had begun to clean up a little, I placed the patient again under chloroform, and passing in some strong sutures brought the flaps together once more in the hope that they might be got to unite by granulation. This hope was partly realised ; the hard palate is now entirely closed, but a very wide gap in the velum remains to be dealt with when circumstances appear to be favourable.

I am loth to leave the brief report of this case without saying, in parentheses as it were, a few words about the pharyngeal tonsil which, with the utmost fidelity to nature, Mr. Sanders has depicted through the wide cleft. It could be noticed that it consists of a dark, median aperture surrounded by an irregular granular mass. This mass is made up of lymphoid material exactly like that surrounding the apertures in the faucial tonsils. It is the enlargement of this lymphoid tissue which constitutes the disease known as post-nasal growths, or adenoids. The faucial tonsils of this girl were enlarged, and she was also developing a fair crop of adenoids, which were, as I have already said, scraped away before the palate was touched. The central opening of this tonsil leads

into a small cavity, which is often spoken of as the "pharyngeal bursa." Early in fœtal life the cavity is continued upwards towards the third cerebral ventricle by a duct known as the cranio-pharyngeal canal, where it apparently ends in anatomical and developmental obscurity.

Case 2. The patient was a girl, 4 years of age, known to Dr. Griffiths of Swansea and to Mr. L. Lewis of Neath, with a cleft extending from a

Fig. 2.

Cleft of hard and soft palate.

short distance behind the incisor teeth along the soft palate (fig. 2). It was of fair width, and also through it was visible a large spongy pharyngeal tonsil. I cleared away the adenoids in May last, and a few weeks afterwards I operated on the cleft. Union was perfect throughout except for a pinhole opening towards the front. The hole, however, was so small as not to be actually visible, being hidden in the mucous membrane. By this time I dare say that it is completely closed.

Fig. 3.

Cleft of hard and soft palate.

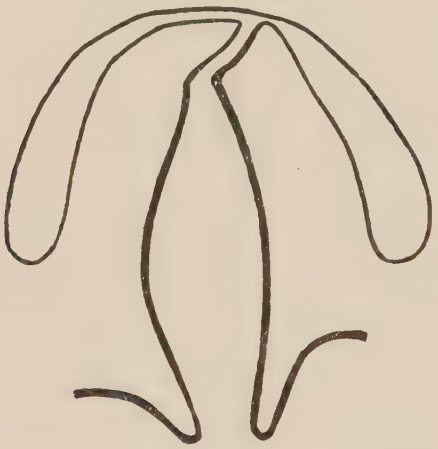
Case 3. The patient was a little girl aged 3 years and 1 month, under the care of Mr. Biggs of Hendon. Her mouth was small and the muco-

periosteum at the edges of the cleft (which involved most of the hard palate) was extremely thin. But as a set-off against this the palate was well arched and the halves of the velum—as shown in the adjoining sketch (fig. 3)—were not far asunder. The union was complete throughout. The operation was done in April. I saw her on November 16th last, and found a sound linear scar running through the middle line of the palate and uvula. Just behind the incisor teeth two blackened wire sutures were harmlessly lingering.

After operating on a child I never trouble to remove the sutures, unless when the wound has healed they are still scratching the tongue. The sutures do no harm and they may be safely left to find their own way out.

Case 4. This patient was a girl, aged 2 years, who was under the care of Dr. Gardner of Bournemouth. I had operated on her hare-lip when she was two months old, and had then arranged to deal with the cleft of the palate when she had completed her second year. The cleft extended through the hard palate, having been originally continuous with the fissure in the lip, which was to the left of the median line (fig. 4). At the

Fig. 4.



Complete palatine cleft extending forwards through inter-maxillary bone.

time of operation—which was the beginning of last June—the palatine cleft still ran through the intermaxillary bone. The disadvantage of this feature was that on the left side the flap of muco-periosteum could not be detached at its anterior extremity lest its blood-supply should prove insufficient. However, the case turned out very well, and when I saw the child on November 15th, there was sound and perfect union throughout, except for the presence of a hole at the back of the hard palate of the size of an ordinary shot-corn. With the growth of the child this will entirely fill up, and, indeed, at the present time I am not sure that the gap does actually extend through into the nasal cavity.

Case 5. This, the last of the series, was an infant aged 8 months, who was sent to me by Mr. Parsons of Wimbledon. Her cleft involved the soft palate and the posterior third of the hard palate (fig. 5). I operated on her on July 10th, and she was taken home a fortnight later with perfect union even to the tip of the uvula. This was the youngest age—8 months—at which I have ever operated on a cleft which implicated the

hard palate, though I have successfully dealt with clefts of the soft palate at an earlier period.

Fig. 5.

Cleft of soft and back of hard palate.

It will be, I think, an interesting and instructive element in the discussion if an expression of opinion is obtained as to what is the best time for endeavouring to close a cleft—(*a*) in the soft palate, and (*b*) in the soft and the hard palate of a healthy child. For my own part I am getting earlier and earlier with my operations; and for this advance I am much indebted to an article written by Mr. Clutton. The fourth patient was only just two years old when I operated on her complete cleft. When her father wrote to me a few days before the operation, he said:—"She is now 2 years old, and as far as we can judge her speech will be affected by the cleft." He hit the nail upon the head. If the speech is to be improved to the utmost the mouth must be roofed in at the very earliest moment. For a soft palate, the child being in good health, the time for operating is somewhere in the first six months, I think. For a hard and soft palate together, it is, I think, in the second year, but I should not be surprised to hear that it may safely be shifted to a still earlier period. It will be noticed that in none of these cases have I suggested the division of the operation into two stages—one for the hard and the other for the soft palate. I used formerly to practice that method in certain difficult cases, but I have now given it up. It is full of disadvantages, and I do not find that it possesses any merit to counterbalance them.

Mr. John Morgan observed that in the glamour that surrounded operations practised under antiseptic methods one was apt to lose sight of operations in which antiseptics could avail them little if at all. In

reference to the point as to the age for operation in cases in which the cleft was confined to the soft palate he himself had been prompted by Mr. Clutton's paper to intervene at an earlier age, but his experience in two or three cases had been somewhat unsatisfactory, and he had thus an unfavourable impression of the practice of operating at an earlier age, and would advise postponing operative interference until the eighteenth to the twenty-fourth month. There were many reasons for this course, the first being that a child with cleft palate came into the world under great disadvantages and was probably weakly to begin with, and he could not take his nourishment easily. No one would care to undertake the operation during the process of teething, and this would bring them to the eighteenth month or thereabouts. He admitted that after the canine teeth had erupted there might be an interval pending the cutting of the molars which might be utilised for operative purposes, but, failing this, the operation could not be done before the twenty-fourth month. As pointed out by the author, the object of the operation was not so much to assist the child in swallowing its food as to prevent defects of articulation, but a child 2 years of age did not talk much and could not at that age have contracted a habit of articulation which could not be overcome. With a good instructor the formation of a bad habit of speech could even be greatly prevented, and he referred to the case of a child 9 years of age who had worn a large artificial palate for many years until the tissues were more like cartilage than mucous membrane. After two or three operations he managed to unite the whole palate. In this case, in spite of a large cleft, owing to the care and assiduity of his mother, the child talked so well that when the palate was united by surgical means one could hardly detect any defect at all; indeed, had it not been for an unfortunately treated hare-lip, there would probably have been none at all. That child was at present an officer in the Indian Army. In respect of operations on the hard palate, the operator had to take so many things into consideration that no hard and fast code of rules could be laid down. It might be possible to operate soon after the primary dentition or it might be necessary to wait. If circumstances were favourable, it might advantageously be done at the second or third year. He commented on the fact that operations performed in private were much more successful than those done in hospitals, and agreed that the large quantity of dried mucus that accumulated in these cases offered an excellent resting place for many varieties of micro-organisms.

Mr. Clutton said he had not come prepared to speak and had been surprised to hear his paper referred to. He did not think the age at which the operation should be done depended upon whether the cleft involved both the soft and hard palate or not. It was easy enough to close one or the other or both at the same time, provided that the tissues had the form and thickness to enable them to be brought together. If the palate was high, the shape of a Gothic arch, when the flaps were brought down they occupied a shorter distance than they did higher up, whereas if the arch were horizontal they gained nothing by bringing them down, because the lower level was not shorter than the place they originally occupied. It depended, therefore, largely upon the height of the palate rather than the width of the cleft. Then, again, it mattered a great deal whether the membranes were thick or thin. At six months the palatal mucous membrane was often as thin as tissue paper, while in others it was strong enough to hold the sutures. He had operated on several infants under 12 months, and he made a practice

of doing it under 2 years. After the third or fourth year he thought there was very little to gain by waiting. He had operated as late as the twenty-fifth and twenty-sixth years of age, and had found that the voice did improve even then. This, too, he thought, depended upon whether or not the palate was of the proper length antero-posteriorly. He preferred some other than the silver suture, and it appeared to him to be quite unnecessary to put a bridle in the child's mouth as advocated by the author. He himself had never had any trouble with the tongue, and his results had almost always been good. He used fishing gut and horse hair as sutures. The author had not said anything about relief incisions at the side, not the incisions made close up to the teeth. He thought that many failures were due to want of care in the relief of tension at the extreme edges, viz., at the last molar of the upper and lower jaws. This incision relieved the pull upon the tissues very considerably. Personally, he never opened the mouth for a week, for it did no good, and looking at the mouth only made the child cry. If the surgeon would content himself with just playing with the child and passing on, he would find at the end of a week that there would be no difficulty in getting the child to do what was asked. He was very careful about removing the stitches, and often gave an anæsthetic for the purpose. He had observed that the suture holes often underwent enlargement during the second week, though he was aware that they subsequently cicatrised.

Mr. D'Arcy Power said that the really difficult cases of cleft palate were those in which the vault of the mouth was nearly flat whilst the cleft was either very wide or was rather one-sided, owing to faulty development of the palate process of the superior maxillary bone on one or both sides. When the muco-periosteum had been separated as completely as possible it was often difficult to unite the edges without undue tension. He asked whether Mr. Davies-Colley would give to the meeting the further results of his method of treatment by the flap operation? It was undoubtedly useful in the difficult cases to which Mr. Power had referred. In operating upon such a case last week, the speaker had found that it was impossible to free the flap sufficiently to bring it across the cleft without producing such tension as was likely to endanger the success of the operation. The superiority of results in private practice he fully recognised, but he thought that it applied to every surgical operation, and was due to the better stamina and the good hygienic surroundings of the patients.

Mr. Davies-Colley said that when he had the opportunity of choosing the age he preferred 14 months. The plan he had adopted had been to carry the flap over from one side to the other, by which means tension was very much diminished and one could be almost certain of getting union of the two sides of the hard palate. His experience had not been quite so satisfactory in respect of union of the soft palate at the same time in very young children. In cases with a flattened arch and with considerable width between the sides of the cleft he thought there would be no difficulty in uniting them by the means he had recommended. His more recent experience, since reading his paper 18 months ago at the Medico-Chirurgical Society, had been three cases of complete cleft of the hard and soft palate between 14 and 18 months of age. In two he had succeeded in obtaining complete union of the hard, and considerable, though not complete, union of the soft palate by these means. The third case was a very difficult one. He had previously operated upon the

patient for double hare-lip, it being one of these extreme cases in which the præ-maxillary bone seemed to hang from the tip of the nose, and there was considerable contraction of the upper lip, so that access to the mouth was limited and difficult. It would probably have been better to divide the lip to get more room. In endeavouring to split the two halves of the soft palate he cut across part of the base of his triangular flap, and consequently a good deal of the flap disappeared, and the operation was practically a failure. He repudiated the idea of wishing to adopt the flap operation in every case. Of six cases which he had had during the last six months four had been done by the ordinary method, but he did not employ this method in the case of young children, because the flap operation was so much more certain in its effect. He wished to enter a plea in favour of operating on these cases very early, because the cleft was thus closed before the child began to talk and the resulting deformity of the face was avoided.

Mr. Arbuthnot Lane said the most important point in the treatment of complete clefts was to have plenty of room. He thought that the principle of sewing up the hare-lip at an antecedent period to the cleft, as at present in vogue, was altogether bad. He himself left the hare-lip untouched until he could do the whole operation at once from before backwards. If, in cases of hare-lip already operated on, he had the slightest difficulty in obtaining a good view of the parts and so getting plenty of room to work in, he split up the united lip. He mentioned incidentally that he had more than once come across wire sutures deeply embedded in the tissues. He alluded to a self-retaining gag of his invention.

Mr. Walsham observed that Mr. Clutton's remarks in respect of the bearing of the height of the arch were very much to the point. He suggested that it was better to defer paring the edges until the muco-periosteum had been detached from the bone, because by so doing one had edges in better condition for union than if pared earlier in the operation. He himself, following Mr. Tom Smith, made a small incision about three-quarters of an inch from the edge of the cleft, passed in an aneurism needle, rapidly separated the muco-periosteum, and then cut through the reflection from the palate to the floor of the nose before facing. In that way one had only one bleeding instead of two, and by saving the edges to the last one got a cleaner and more promising surface to work with. Another point of importance was that the palate should be perfectly flaccid. He himself was never satisfied until the whole palate had no tension at all upon it. This could be brought about by free division of the reflection of the mucous membrane where it passed to the floor of the nose, and by making very free lateral incisions. He had often seen these incisions made too short, never too long. He did not look at the palate for a week, for it could do no good, and was better left quite alone. The child was not allowed to speak and no one was allowed to look into the mouth for this length of time.

Mr. Kellock said that, as a rule, it took more than two or three days for children to become thoroughly accustomed to the novel surroundings; in fact, they generally allowed a week. He suggested that the cause of the accumulation of mucus was precisely what the operation removed, and when the cleft was closed the secretion ceased of itself just as did the bronchial secretion in tracheotomy after removal of the tube. He insisted on the necessity of making a careful examination of the patient before operating in view of the possibility of some other abnormality

being present, and he related the case of a child who died of uræmic poisoning after the operation. In this case there was only one kidney. He did not think that 24 hours' rectal feeding was conducive to tranquillity, and if the child could swallow without detriment to the palate he thought it was better that he should do so. He pointed out that it was well not to be too sanguine in respect of the talking in hospital patients, for it often happened that no manifest improvement took place for some considerable time after the operation.

THE DISTRIBUTION OF MOTOR AND SENSORY SYMPTOMS FROM INJURY TO THE ROOTS OF THE BRACHIAL PLEXUS.

By C. E. Beevor, M.D., F.R.C.P.

In the two following cases of injury to the upper limb, I propose to describe :—

1. The muscles which were paralysed in the upper limb.
2. The exact area affected by anæsthesia.
3. The situation of the lesion which could cause paralysis of such a group of muscles, *i.e.*, whether in the large nerve trunks, in the spinal roots entering into the brachial plexus, or in the spinal cord itself.
4. The comparison of this group of muscles with lists of other authors.
5. The importance of the diagnosis of the position of the lesion on the prognosis and treatment.

James C., 25, printer, married, was working near a gas-engine in August, 1893, when his right hand got in the strap, and he was pulled off his feet and thrown right over so that he fell on to his back ; patient thinks he dislocated his shoulder, but this was not observed either at the Great Northern Hospital, or at St. Thomas's where he saw Mr. Pitts.

Immediately after the accident the right arm was paralysed, and there was some loss of sensation.

He came under my care at the National Hospital, Queen Square, in December, 1893, and it was then noticed that he had complete paralysis of all the muscles of the right upper limb with the exception of the serratus magnus, the small muscles of the hand, and the flexors of the wrist and fingers, which were not at all affected, and of the pectoralis major and latissimus dorsi, which acted weakly, and that he had some loss of sensation over the outer side of the right arm.

On examining him in detail he was found to have the power to abduct the thumb, to abduct and adduct the fingers, to flex the fingers and thumb with fair force when the wrist was kept extended, and to flex the wrist.

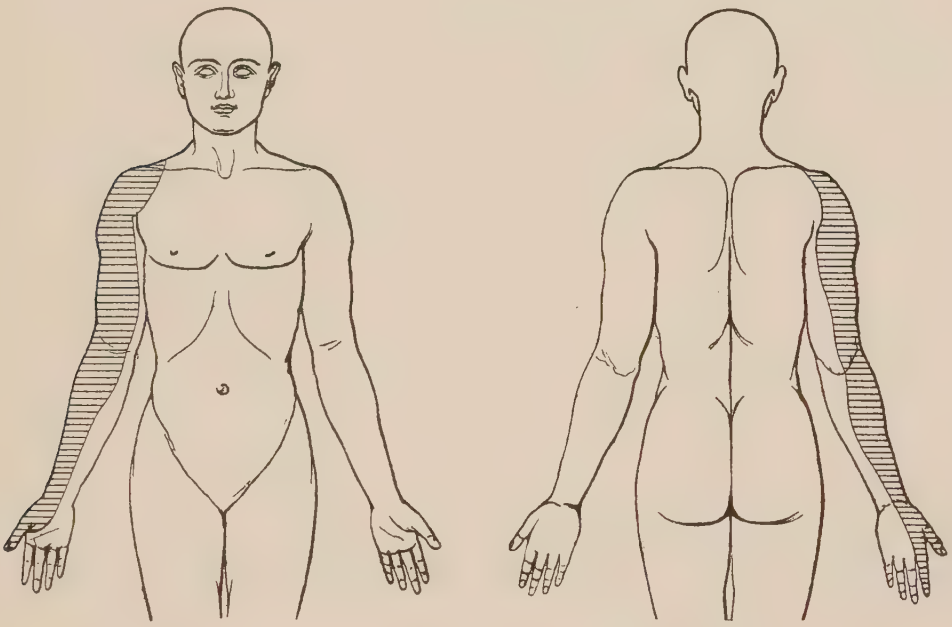
On the back of the forearm there was wasting of the muscles, and he had no power to extend the thumb, fingers, or the wrist ; pronation of the forearm could be performed but not supination ; there was no movement in the supinator longus, the biceps and brachialis anticus to flex the elbow or in the triceps to extend it. There was no action of the deltoid and the supraspinatus to abduct the shoulder from the trunk.

But in adducting the shoulder-joint the latissimus dorsi and the lower (*i.e.*, sternal) half of the pectoralis major acted well ; and when the humerus was passively advanced to the horizontal line he could carry the arm towards the middle line using the whole of the pectoralis major.

Rotation in of the shoulder by the subscapularis and teres major, and rotation out by the infraspinatus and teres minor, were absent.

The scapula could be well advanced by the serratus magnus and its lower angle rotated forwards, when he attempted to advance the

Fig. 1. Fig. 2.



Case 1. 5th, 6th, and 7th Cervical Roots.—Area of loss of sensation to light touches.

humerus, and he could elevate the scapula by the trapezius and levator anguli scapulæ, and draw it back by the rhomboids.

To electrical testing by the faradic current, no reactions were obtained in the deltoid, biceps, supinator longus, triceps, and radial extensors of the wrist, and only a slight reaction in the extensors of the fingers, while to the galvanic current all these muscles gave the reaction of degeneration ; the pronator radii teres and the flexor carpi radialis did not react to either current.

When I saw him in December, 1893, sensation was considerably improved, and there was no absolute loss to tactile sensibility anywhere, but there was marked loss to very slight touches over a definite area, which extended along the outside of the right upper limb from about two inches above the acromion to the hand.

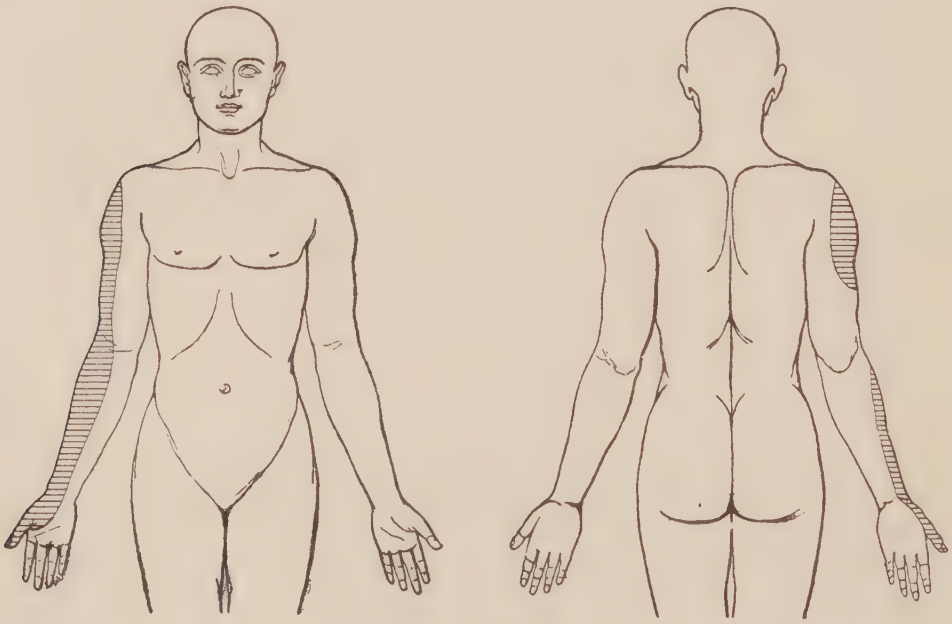
Along the front of the upper arm it extended to a line drawn from the

anterior fold of the axilla to a point midway between the front of the elbow and the inner condyle of the humerus, and from there to the middle of the wrist; behind the area is limited by a line drawn along the middle of the posterior surface to the olecranon, and then on to the middle of the posterior surface of the wrist, the line was not quite straight, and both above and below the olecranon extended beyond the line given. In the hand the area of deficient tactile sensibility affected the whole of the thumb, including the thenar eminence and the back of the thumb, and also the radial side of the hand including the posterior surface of the index finger. Loss to painful impressions was practically the same, but was not so extensive.

The subsequent history of the case was that he has gradually improved, being treated by the constant electrical current and massage, and now at the present time he has recovered power in all his muscles—the deltoid being still rather weak—except the extensors of the wrist, fingers, and thumb, the supinator longus, the pronator teres and flexor carpi radialis, in which muscles no reaction can be obtained to the faradic current, and only a slight slow contraction to the negative pole. There is no loss of sensation, but the feeling, he states, is different over a narrow strip from the shoulder along the outer border of the upper arm to the hand where it involves the posterior aspect of the thumb and of the index finger, taking in its metacarpal bone and first phalanx.

The other case was that of a man, aged 40, who on June 26th last was standing upon a trolly, packing hay, when the horse started, and he was

FIG. 3. FIG. 4.



CASE 2. 5th and 6th Cervical Roots.—Area of loss of sensation to light touches.

pitched off the cart falling eight feet on to his right shoulder and neck, so that his head was bent backwards and towards the other shoulder. He did not lose his senses, but immediately felt acute pain in the right shoulder and side of his neck, and at once had numbness of the right

thumb, but not of the fingers, the numbness extending up to the shoulder along the outer surface of the limb. He at the same time lost power in the right arm, but could extend and flex the fingers but not the thumb.

Two days later he came to the Great Northern Hospital, and on July 17th Mr. Bridges, the house-surgeon, showed the case to me.

He then had some wasting of the whole of the right upper limb, but especially of the muscles above the elbow and about the shoulder. He could perform all movements in the hand, separating and adducting the fingers, opposing and abducting the thumb, flexing and extending the thumb, fingers, and wrist. All these movements, though well executed, were decidedly weaker than the other side. Pronation of the forearm was present, though weak, but not supination. The elbow he could not flex or extend, there was no action of the supinator longus, and the biceps and triceps were only just seen to contract, but not sufficiently to move the joint. In the shoulder joint the deltoid was very much wasted, and no movement was obtained in this or in the supraspinatus muscle. The pectoralis major was completely paralysed for all movements, except a narrow band of fibres going to the upper end of the sternum appeared on adducting the arm in the horizontal plane. In depressing the raised arm there was very slight contraction of the latissimus dorsi. Rotation of the shoulder in and out absent. The serratus magnus acted very feebly, while the trapezius rhomboids, levator anguli scapulæ acted well, but not quite so strong as on the other side.

On electrical testing with the faradic current the muscles of the hand and forearm reacted well, but not so readily as on the opposite side, with the exception of the flexor carpi radialis, pronator radii teres, extensor carpi radialis, supinator longus, and supinator brevis. In the upper arm there was no reaction of the deltoid; and the biceps, triceps, latissimus dorsi, and pectoralis major only just reacted to very strong currents. All these affected muscles gave the reaction of degeneration with the constant current, except the flexor carpi radialis and pronator teres which gave no reaction to either current.

Sensation was lost to slight touches, and painful impressions were blunted over the outer surface of the right upper limb from the shoulder to the hand, extending half way up the side of the neck and occasionally it seemed to extend backwards over the scapula, but this was not so constant as on the outer side of the limb. The area of anæsthesia, as shown by the diagram, was less than in the first case.

He has been treated by the constant current, and he has regained some power, so that he can just supinate the forearm, and just flex the elbow by the biceps and brachialis anticus, also the serratus magnus acts better.

On the question of diagnosis we have to decide whether the injury took place in the main trunks as the median, musculo-spinal, and ulnar nerves, in the spinal roots which form the brachial plexus, viz., the 5th, 6th, 7th, 8th cervical and 1st dorsal, or in the brachial enlargement of the spinal cord itself.

On looking at the list of the muscles affected in the two cases, we find that in both, some of the muscles supplied by the median nerve, viz., the flexor carpi radialis and pronator teres were paralysed, and are so still, while all the others on the front of the

forearm and in the hand escaped; and in the second case, taking the musculo-spinal nerve, the triceps, supinator longus, extensor carpi radialis were paralysed, while the extensor of the fingers—a very weak muscle—escaped. Also on looking at the distribution of the anæsthesia, it cannot be referred to the lesion of any one or more nerve trunks in the limb. It is, therefore, difficult to understand how injury to a nerve trunk could produce complete paralysis of some of the muscles supplied by it and leave others intact, and a lesion in the nerve trunks will not, therefore, explain the muscles paralysed.

The differential diagnosis between a lesion of the cervical roots and the spinal cord is more difficult, but from the fact that there was never any evidence of paralysis of the legs or any affection of the sphincters, and from the nature of the injury I have no doubt that the lesion was in the roots forming the brachial plexus.

Paralysis of definite groups of muscles from falls on to the shoulder and the side of the head were first described by Erb* as causing paralysis of the biceps, brachialis anticus, deltoid, and supinator longus, and were ascribed by him to stretching the 6th cervical root; other cases have been described, and I brought one case before the Clinical Society where a woman went to sleep with her neck resting against the edge of the table, and on waking up she had paralysis of the above muscles with some transient anæsthesia.

Lists of muscles supplied by the roots of the brachial plexus have been obtained from stimulation of the roots in monkeys, by Ferrier and Yeo,† and by Forgue in France; and in man, by Herringham,‡ from careful anatomical dissection, and Thorburn,§ by observing the muscles paralysed after fractures of the spine at different levels of the brachial enlargement.

In Thorburn's list it is not easy to say whether the paralysis is the result of injury to the grey and white matter of the cord or to the roots which come off from it, but it seems more likely to be to the cord, and as we do not know for certain that the grouping of the muscles in the cells of the anterior horns is the same as that of the spinal roots given off from these cells, and is probably different, we cannot compare the present cases exactly with Thorburn's list.

* 'Ziemssen's Encyclopædia,' vol. xi.

† 'Proceedings Royal Society,' 1881.

‡ 'Proceedings Royal Society,' 1886.

§ 'Surgery of Spinal Cord.'

As, however, it is one of the most reliable that we have, I will do so with certain additions.

Thorburn's list given below was made from cases of fracture of the spine, and shows the muscles supplied by the spinal cord at the different root levels ; I also indicate which muscles in my two cases were paralysed :—

4th cervical root, supra- and infra-spinatus; all paralysed in both my cases.

5th cervical, biceps, brachialis anticus, deltoid, supinator longus ; all in both cases.

6th cervical, subscapularis, teres major, pronators, latissimus dorsi, pectoralis major, triceps, serratus magnus ; all paralysed in both cases, except latissimus dorsi, pectoralis major, and serratus in Case I, and latissimus dorsi, triceps, and serratus were incompletely paralysed in Case II, the flexor carpi radialis and pronator teres were paralysed in both cases, extensor carpi radialis in Case II.

7th cervical, extensors of wrist ; in Case I these were paralysed as well as the extensors of fingers and thumb, but not in Case II.

8th cervical, flexors of wrist and fingers, and 1st dorsal, small muscles of hands were not affected in either case.

On comparing the muscles affected in my two cases with Thorburn's list, it is seen that in the first case all the muscles supplied by the 4th, 5th, 6th, and 7th cervical roots were paralysed with the exception of the latissimus dorsi, pectoralis major, and serratus magnus; and in the second case all the muscles supplied by the 4th, 5th, and 6th cervical were involved, but not the 7th and 8th cervical and 1st dorsal.

On comparing these cases with Herringham's list it will be observed that the muscles in the first case correspond very closely with those given for the 5th, 6th, and 7th cervical roots, the triceps being the only muscle which should have partially escaped, as in Herringham's list it is supplied by the 8th as well as the 7th cervical, and also excepting the serratus magnus, latissimus dorsi, and pectoralis major which I will refer to later.

In the second case the affected muscles correspond to that given by Herringham for the 5th and 6th cervical roots with the exception of the triceps and latissimus dorsi, which ought to have escaped.

From a comparison with Thorburn's and Herringham's lists, it

seems highly probable that in my first case the lesion was in the 5th, 6th, and 7th cervical roots, and in the second case, in the 5th and 6th cervical roots, and perhaps the 4th cervical as well in both cases.

The manner in which the serratus magnus, latissimus dorsi, and pectoralis major escaped in the first case and not in the second, is difficult to explain, I can only suggest that the accident may have had something to do with it, as severe traction on the upper limb would stretch most the nerves passing along the roots to the limb, and might spare those going to the large muscles on the trunk, *i.e.*, the serratus magnus, latissimus dorsi, and pectoralis major, whereas in the second case the shoulder, including the scapula and clavicle, was violently pushed down and might stretch all the fibres in the roots.

The reason why the 7th, 8th, and 1st dorsal roots escaped in the second case, is explained by the fact that the distance between the head and the shoulder being violently increased, the greatest stress would fall on the 5th and 6th roots, rather than on the 8th and 1st dorsal.

The anæsthesia in the second case would therefore be that caused by a lesion of the 5th and 6th cervical roots, and in the first case, that for the 5th, 6th, and 7th cervical roots (Figs. 1, 2, 3, 4); the chief difference being the greater extent anteriorly, and especially posteriorly, as well as the involvement of the back of the index finger when the 7th root was involved.

The prognosis of these cases varies according to whether the diagnosis is made of a lesion in the cord or in the roots.

In a lesion of the cord, if the muscles do not begin to recover within three to six months, their chance of ultimate recovery is not very good, whereas in lesions of roots, as is well shown in the first case, almost complete recovery may take place, even though it takes two years, and it is probable that this case will recover completely.

The treatment is also influenced by the diagnosis, for in the root cases the use of the constant current and systematic rubbing should be persevered in with a hope of success for months after the injury.

Lastly, the question must briefly be considered as to whether the list of muscles supplied by each root is a physiological one so arranged as to co-ordinate some special movements, or a purely anatomical one without any relation to function. If the diagnosis of these cases be accepted, I think there can be no doubt that they

prove that the distribution is anatomical and not physiological—a view which Dr. Herringham has held from the result of his dissections—for it is hardly possible to imagine that a distribution, in which paralysis of the flexor carpi radialis occurs and not of the flexor carpi ulnaris, of the extensor carpi radialis and not of the extensor carpi ulnaris, of the pronator teres and not of the pronator quadratus, can be physiological.

The question as to whether the group of muscles supplied by any root of the brachial plexus is a physiological distribution, is of great importance. Following other writers, I have always considered that the muscles supplied by each root were grouped together to perform some definite movement, but since working out the distribution in these two cases, which are typical examples of a root lesion, I do not see how it is possible to maintain the view that the arrangement is physiological, and if these two cases be accepted as due to lesions of the roots, the arrangement of the muscles must be on an anatomical or developmental basis.

The next question which arises is, if the distribution of the muscles supplied by each root is anatomical, what is the arrangement of the muscles supplied by the cells of the anterior horns of the spinal cord at the different levels, is this the same in each segment as that of the anterior root which springs from this segment, and if it is not the same, is the arrangement physiological or anatomical?

With regard to these questions, I think we have been too ready to assume that the muscles supplied by each segment of the cord are the same as those supplied by the root coming from that segment, and we require further evidence from undoubted spinal cord cases, such as infantile paralysis, before answering this last question.

The PRESIDENT observed that there might be some difficulty in accepting the view that the arrangement in the spinal cord was anatomical and not physiological. It is movements and not muscles that are represented in the brain, and if the arrangement in the spinal roots is anatomical, muscles, and not movements, must be represented there.

Dr. BEEVOR, in reply, explained that the title of the paper had been wrongly given. It should have been, "Injury to the Roots of the Brachial Plexus," and not the brachial plexus itself. He agreed that the spinal cord was physiological. Formerly he had held the view that the roots were also physiological, but in the light of these two cases he now thought that while the arrangement in the spinal cord was physiological, that in the roots was anatomical.

December 9th, 1895.

THE DIAGNOSIS AND TREATMENT OF EARLY CANCER AND CYSTS OF THE BREAST.

By Thomas Bryant, M.Ch., F.R.C.S. Eng. and Irel.

A series of cases of cystic disease of the breast, most of which had been diagnosed as cancerous tumours, having recently passed under my notice, has induced me to place the following notes together, for I am convinced by the forcible evidence of experience that the diagnostic acumen of my professional brethren is not exercised in this class of cases with the same care as it is in other classes, and particularly in such as have a more immediate bearing upon life; and under these circumstances, since the diagnosis of this class of cases is uncertain, it goes without saying that the treatment is of the same uncertain character. A well-marked or typical example of carcinoma of the breast, with the infiltration of one or more of its lobes, the dimpling, puckering, or infiltration of the skin over the affected lobe, with or without some retraction of the nipple, is diagnosed at once, at whatever period of life the disease may have appeared, and if the lymphatic glands of the axilla are enlarged the diagnosis is considered to be complete; the most reliable indications for diagnosis being the infiltration of the breast gland with the more or less infiltration of the skin over the gland. It may also be said that a nodular, movable lump within the capsule of the breast, which slips about freely on manipulation, and which seems to be attached to, but neither to be infiltrating nor to form part of, the breast gland itself, with a natural nipple and normal integument covering the growth, is also readily recognised as one of adeno-sarcoma; and if the growth itself be fleshy and the subject of the growth be young the affection is regarded as one of adenoma or glandular tumour, and if the tumour be hard and fibrous as an adeno-fibroma; although, should an enlarged axillary lymphatic gland be found under either of these conditions some difficulty in the diagnosis may be experienced. Under both circumstances, however, the age of the patient—of being over 40 years of age in one

case and under 30 years in the other—has probably an undue influence in determining the decision. Again, in advanced ulcerating or fungating conditions of cancerous or sarcomatous growths, diagnostic difficulties are not likely to occur, and if they do, such difficulties would not probably have any injurious influence on the treatment of the case. In inflammatory affections of the breast as met with in single, pregnant, or suckling women, difficulties of diagnosis are not often experienced, although examples of chronic abscess of the breast, tuberculous, specific, or simple, when they appear at some remote period after functional activity of the gland has disappeared, may occasionally cause confusion. The following case is much in point :—

Case 1. A woman aged 39 years, the mother of a child aged 2½ years, came to me for some thickening and pain in her left breast associated with a retracted nipple, puckering of the skin over the thickened lobe, and enlargement of a lymphatic axillary gland. The local symptoms as described at once suggested some carcinomatous infiltration, but on going into the history of the case it was discovered that the woman had never been able to suckle with the affected breast on account of its having a retracted nipple which had followed the formation of an abscess in the breast twelve years previously, and that she had been suckling with her right breast up to five weeks before I saw her. With this history the case became fairly clear, and some chronic inflammatory condition of the left breast was diagnosed and subsequently treated with success. The puckering of the skin over the infiltrated breast lobe was due to its adhesion to the deeper structures, the result of the abscess which had formed there twelve years previously.

The difficulties of diagnosis in tumours of the breast may be said to come in when there are any or many deviations from the typical examples which have just been described, and as I believe these difficulties can be diminished I propose to call attention to them, and for purposes of clearness have grouped the difficult cases as met with in practice under three headings, looking at them from a practical point of view with diagnostic and curative intentions.

Group I includes cases in which, either in a young, middle-aged, or even old married or unmarried woman, there is some enlargement or thickening of one or more lobes of the mammary gland, without any external evidence of wrong either in the integument covering the affected lobe of the breast, the nipple, or the lymphatic glands.

Group II comprises cases in which there is a distinct and very evident lump, the size of a nut or walnut, shelled or

unshelled, and inseparable from the breast gland, with some of the local conditions generally accepted as being indicative of a cancerous tumour, such as a flattened or retracted nipple, with or without an enlarged lymphatic axillary gland.

Group III includes cases in which, in the middle-aged woman past child-bearing, the breast gland feels to be either generally or in one or more of its lobes harder than natural, coarse or knotty, the knots varying in size from small to large peas or nuts, and where there may be at times, with or without the application of pressure upon the gland, some discharge from the nipple of either a clear yellow or blood-stained fluid, or some cheesy pultaceous material, associated or otherwise with an enlargement of some lymphatic glands. In all the cases included in these three groups difficulties in diagnosis may be experienced, but they are surely not so serious as not to be overcome wholly or in part by careful examination and thought, or, at any rate, overcome with sufficient clearness as to justify the adoption of a definite line of treatment, based upon a highly probable diagnosis and the rejection of that pernicious negative line of treatment which must be described as that of drift.

Group I.

This group includes cases in which, either in a young, middle-aged, or even old married or unmarried woman, there is an enlargement or thickening of one or more lobes of a mammary gland without any other external evidence of wrong in either the integument covering the affected lobe of the breast, the nipple, or axillary lymphatic glands. In such a case, if found in an unmarried girl, we are justified in coming to a conclusion that the affection is to be explained by the presence of some local congestion or inflammation associated with either catamenial disturbance or due to some local injury, and the case may be regarded as a simple one which is probably amenable to curative general and local treatment without operation. If found in a middle-aged woman who either is pregnant or has been suckling recently, or even somewhat remotely, the enlargement may also be regarded as being probably inflammatory, although the possibility of the thickening being due to retained and concentrated milk products or to some chronic suppurative action should not be overlooked. But if found in a single or in a married middle-aged or old woman

whose breasts have never been, or have long ceased to have been, functionally active, and in whom the elements of traumatism can be eliminated, the case cannot be thus explained, and to shelve it as one of irritable breast in a woman at a certain period of life is neither judicious nor in any way wise practice; for in the truly irritable breast the whole gland, or both glands, are usually more or less implicated and highly sensitive, whereas in the class of cases now under consideration what seems abnormal appears only as an induration or thickening of one lobe of an otherwise normal gland, and this lobe is not usually very tender. Indeed, if we apply to the consideration of such a case as this the invaluable method of diagnostic investigation—that of exclusion—we shall soon come to the conclusion that the probabilities of the case before us are in favour of the view that it is one of carcinoma in its very earliest stage—that of commencing infiltration—although the possibility of the enlargement being due to the presence of a cyst should not be forgotten; and, if this diagnosis be correct, surely there is but one sound line of treatment to follow, and that is the removal of the disease. As a preliminary step to this measure, if found needful, I hold, therefore, that an exploratory incision should at once be made into the doubtful swelling, for by this simple act the true nature of the affection will not only be definitely determined, but the very best means will have been employed by the surgeon to bring about a cure—for, if a cyst be found, the exploratory incision will enable him to cure the trouble in the way he thinks best, and if the enlargement be due to a carcinomatous infiltration the surgeon would at once proceed to its extirpation with the whole gland—and this he would do under such favourable circumstances as to justify his giving a prognosis of the most hopeful and confident description. For if a permanent cure can ever be looked for after the extirpation of a cancerous tumour, it surely is more likely to follow the removal of a disease in its earliest local stage than in any other more advanced. For a surgeon to leave a patient in the condition described, to drift with what may be, and in all probability is, a local cancerous affection in its very earliest stage, when the very best prospects of a cure by its removal may reasonably be entertained, until, by the appearance of more marked symptoms, the diagnosis can no longer be considered doubtful is in my view of the matter a neglectful and culpable act; for, so far as the

patient is concerned, nothing but harm can come by delay, whereas by the action I am urging nothing but good can possibly accrue. The argument I am now using if put before a patient is almost sure to have its full value recognised, and in my personal experience it, as a rule, leads to action. I have in at least three dozen instances followed this practice during the last ten or twelve years, and I am pleased to add that I have not as yet had a case in which a local return of the disease has come before me, although I have had one in which the opposite breast was similarly attacked four and a half years after the removal of its fellow.

Group II.

This group will include cases which are met with in middle or old age, and characterised by the presence of a distinct and very evident tumour. The tumour may vary in size from that of a nut to a walnut, shelled or unshelled, is inseparable from the breast gland and situated either near the centre of the gland or in one of its lobes. In one case this tumour may be the only objective symptom, the integument over the tumour and the condition of the nipple being normal, whilst in another case one or more of the local conditions which are generally accepted as being indicative of cancer, such as flattened or retracted nipple or an enlargement of an axillary lymphatic gland, may be coexistent. In a majority of the cases included in this group a diagnosis of cancer is at once made, particularly in those included in the latter half, in which either the nipple or lymphatic glands are implicated. But I must here add that in a large proportion of these cases an error in diagnosis has been made which I do not think would have occurred if every practitioner followed the rule which I have learnt to follow as a matter of routine, and that is, always raise the question as to the possibility of the tumour being due to the presence of a cyst, when, should the surgeon's sense of touch be keen enough to detect an elasticity in the swelling, or even a fluctuation, with the patient placed flat upon a couch and the breast gland made to rest upon the ribs, the diagnosis of a cyst may with safety be hazarded, although what the contents of the cyst may be cannot be otherwise than a somewhat dark point. If a clear serous fluid can be made to flow from the nipple by manipulation or pressure

upon the tumour, the probabilities of the cyst being a simple serous cyst are rendered great. If the fluid be brown or blood-stained the existenc of an intracystic growth of some kind may be suspected; and if the discharge be more like pure blood, a soft, solid growth, sarcomatous or carcinomatous, should be feared. When there is no discharge from the nipple, as is often the case, and the other conditions are the same, the chances against the swelling being caused by a cyst are not lessened, although the view of the cystic enlargement being rather due to the presence of some soft, solid sarcomatous growth would be much encouraged.

The flattening out or retraction of the nipple is a condition which should not be allowed to complicate the diagnosis of cases such as these, for the condition is a mechanical one, and whether the ducts of the gland on their way to the nipple are separated by a cyst and so cause retraction of the nipple or are affected by a carcinomatous growth is immaterial, for the result is the same. In all these cases, however, the line of treatment lies in that of exploration of the tumour, when, if the case prove to be one of simple cyst, so much the better, for such can be cured by simple means and the breast gland be saved. If a growth be found sprouting into the cyst the cyst must either be dissected out or the affected lobe of the gland sacrificed; and if the growth has the aspects of a carcinoma the whole gland should be taken away, the finger of the surgeon being used to explore the axillary space through the wound for enlarged glands, with a view to their removal should such be found. But what is all-important for the surgeon to have prominently in his mind when examining any of the cases which have been grouped together under the heading now under consideration is the probability of the case being a cyst, and if there be a question as to its diagnosis, the expediency of having the tumour explored with a view to its cure. The following cases illustrate most of the points to which attention has been drawn.

Case 2. *Tumour in the left breast suspected to be cancerous; exploration; cyst found and cured by sponging it out with solution of iodine and plugging.*—A woman, aged 46 years, the mother of two children, both of whom she nursed, although whilst suckling the second child, now 20 years of age, the left breast became inflamed, consulted me in July, 1894, for a hard, nodular lump the size of a walnut in the sternal half of the left breast, which had been enlarging for about four months. The whole

gland was coarse, but there were no other objective symptoms. As I suspected the lump was due to a cyst, I explored it a few days later and verified the diagnosis. I sponged the cyst out with a strong solution of iodine and plugged the cyst with iodoform gauze. A steady recovery ensued.

Case 3. *Tumour in the breast with retracted nipple supposed to be cancerous; exploration; cyst found and dissected out.*—A woman, aged 52 years, the mother of two children, consulted me for a lump she had noticed in her left breast, which had been growing for six months and which was full of pain. The tumour filled the axillary half of the gland and the nipple was retracted and drawn towards the tumour. I explored the tumour and found one large deeply-seated cyst which did not contain growth. This I dissected out and a good recovery followed. Three years later the patient was still well.

Case 4. *Central tumour in breast with flattened nipple regarded as cancerous; exploration; cyst opened, sponged with solution of iodine, plugged, and cured.*—A married woman, aged 36 years, childless, consulted me for a tumour occupying the centre of one of her breasts which had been slowly increasing in size for many months, but was not very painful. The nipple was completely flattened and spread out over the tumour. I explored the tumour and exposed a large central cyst which contained serous fluid, but no growth. This I sponged out with a strong solution of iodine and plugged with iodoform gauze, and a good recovery followed. This patient was quite well two and a half years later.

Case 5. *Tumour in the breast, thought to be cancerous, in a woman aged 63, which turned out to be a cyst, which was cured by plugging.*—A single woman, aged 63 years, consulted me for a tumour in her right breast which had been slowly increasing for more than a year. The nipple was natural. The tumour had a very regular outline, and to my finger was elastic, which suggested the probability of its being a cyst. I advised its exploration, which was done, and the diagnosis was verified and a cure effected by plugging.

Case 6. *Tumour in the breast the size of an egg; exploration; cyst found and cured by plugging.*—A single woman, aged 40 years, by an accident discovered a tumour in the right breast, which had attained, when I saw it, the size of an egg. It occupied the axillary lobe and had a regular outline. It felt elastic and to a degree was fluctuant. I explored it, and having exposed a cyst with a smooth lining plugged its cavity with iodoform gauze and allowed the wound to heal by granulation. A good recovery ensued.

Case 7. *Central tumour in the breast with flattened nipple simulating cancer; cyst opened, sponged out with zinc chloride, plugged, and cured.*—A woman, aged 51 years, the mother of five children, none of which she nursed, consulted me for a lump in the centre of her breast which had been slowly growing for some months. The nipple was completely flattened out. After examination I suspected the presence of a cyst and recommended exploration. This I did, and having exposed a large serous cyst I incised it and stitched its walls to the edges of the wound in the integuments. I then sponged out the cyst with a strong solution of

chloride of zinc (40 grains to the ounce) and plugged it with iodoform gauze, a rapid recovery taking place.

Case 8. *Tumour in the breast with gradual retraction of the nipple simulating carcinoma; exploration; cyst found, dissected out, and cured.*—A woman, aged 50 years, the mother of two children, came to me with a tumour the size of an egg in her right breast, which had been slowly coming for two years. It had been at times the seat of much pain, and for more than one year the nipple had been disappearing. It had been called a cancer. When I saw her I made out by palpation, on placing the patient in the supine position, fluctuation, and consequently explored the tumour, when a cyst was opened and dissected out, a good recovery ensuing. Three years later this patient was well.

Case 9. *Tumour in the breast diagnosed as cancerous; cyst found containing blood-stained fluid, which was dissected out and cured.*—A married woman, aged 56 years, childless, consulted me for a tumour in the upper half of her right breast which had been growing for six months and had caused pain. There were no other symptoms. Suspecting a cyst I explored the tumour and evacuated blood-stained fluid. I dissected out the cyst and a good cure followed. Three years and a half later the patient was well.

Case 10. *Tumour in the breast supposed to be cancerous; cyst found and dissected out; recovery.*—A single woman, aged 48 years, consulted me for a lump in her left breast which she had discovered by accident six weeks previously. It had steadily enlarged, and when seen by me was as large as a Tangerine orange. It was very hard. Suspecting cyst I explored it, and, finding a cyst, I dissected it out and a good cure ensued, This patient's mother and two maternal aunts had carcinoma of their breasts. In such cases as these with cancer in the family the cyst should always be dissected out.

Case 11. *Tumour in the breast: cyst found and dissected out; recovery.*—A woman, aged 45 years, the mother of five children, all of which she suckled without trouble, consulted me for a hard lump in her right breast, which had been slowly growing for many months. It was globular, deeply placed, and elastic, and diagnosed as a cyst. When explored the diagnosis was verified, and the cyst was full of dark brown fluid. The cyst was dissected out and a cure followed.

Case 12. *Tumour in the breast, supposed to be cancer; cysts found in exploration: general cystic disease of the breast; excision; patient well seven years after.*—A single woman, aged 40 years, consulted me in 1888 for a hard tumour in her breast which was supposed to be cancer; it had been growing for some months. I explored it and found it to be a cyst, and that the breast was, as a whole, similarly affected. The gland was consequently excised, and a good cure resulted, the patient at the present time, seven years after the operation, being well. The father of this patient was supposed to have died from abdominal cancer, but it was known that the paternal grandfather and three paternal aunts had died from the disease.

Case 13. *Cyst in the breast with intra-cystic adenoid growth: cyst dissected out; a year later a cyst appeared in the opposite breast, which was*

explored and dissected out, although it did not contain any growth; patient well five years after.—A married woman, aged 36 years, childless, consulted me in 1888 for a lump in her right breast, which I deemed to be a cyst. On exploring it, the diagnosis was confirmed, but in the cyst there was a dendritic growth which, on examination, proved to be an adenoma. I dissected the cyst-growth out carefully and a recovery ensued. A year later a like tumour appeared in the opposite breast, which proved to be a serous cyst. This I explored and dissected out with a good result. The patient was well five years later.

The disappearance of cysts.—In the treatment of cysts of the breast, and particularly of such as have clear fluid for their contents, it should always be remembered that they may spontaneously disappear. In some instances of this kind the disappearance may be for good, but in a general way the cysts reappear after the lapse of a short or long period, either in their original simple form or as cysts which contain some new growth of a malign or cancerous nature. I have seen many cases of this kind, but the two following are typical:—

Case 14. *Cyst in the breast mistaken for new growth, which disappeared spontaneously.*—A woman, about 40 years of age, consulted me for a tumour occupying an outstanding lobe of her right breast, which had been taken by one surgeon to be an adenoma, and by a second as a carcinoma, but these views had been given some months before I saw her. On examination of the breast I found a tense elastic tumour in the gland, which I diagnosed as a cyst, and as the patient's general condition was bad, I saw no occasion to lay the cyst open. Some months passed under treatment, tonics, &c., being administered, and as the general health improved, the tumour diminished, so that in six months it had disappeared. Six months later the woman was still well.

The second case was as follows:—

Case 15. *Cyst in the breast mistaken for carcinoma; recovery.*—A woman, aged 48 years, consulted me in December, 1893, for a lump in the centre of her right breast, which had been enlarging for months, and which had been pronounced to be a carcinoma. She was a married but childless woman, and was under the care of a physician for some simple uterine trouble. On a careful examination with the patient flat on her back, fluctuation was to be detected in the tumour, which was about the size of a Tangerine orange. The patient was highly neurotic and complained of severe pain. Six months later the tumour was larger. For the uterine trouble she was sent abroad, and when she returned, six months later, the tumour was swollen. In another three months it had disappeared, the disappearance of the tumour with that of the uterine affection going on together. She has now been well for a year (August, 1895). This is the largest cyst in the breast which I have ever known to disappear entirely; whether it will reappear, and, if so, in an uncomplicated form, is a point for future observation.

These cases are as interesting as they are instructive, but they are not so common as to justify the surgeon in delaying an exploratory or curative incision in cases which otherwise demand such treatment. Where the general condition of the patient is bad from any cause, procrastination may be practised, and the possibility of a disappearance of the tumour put forward as an encouragement to the patient. I should like to point out as a lesson to be learnt from the first case quoted, that to the surgeon who diagnosed the presence of an adeno-scarcoma instead of cyst, the disappearance of the cyst would have been regarded as a disappearance of the tumour, and I am disposed to believe that all cases of reputed disappearance of these solid tumours are to be regarded as examples of mistaken diagnosis. I have never known a solid tumour of this kind to disappear. To the surgeon who regarded the case as one of cancer I need not say that the disappearance of the growth under whatever local or general treatment he adopted would have helped him as a cancer curer; to some who use electricity, plasters, or faith, such a case of cure would have been invaluable.

Reappearance of cysts after their disappearance.—I should also like to add that if these cysts may disappear they are equally liable to reappear, and when they do so they seem to be liable to reappear, not as simple cysts, but as cysts with intra-cystic growths. This fact is an important one, and tends forcibly to support the practice I have desired to recommend—namely, the early exploration of the cyst with the view to its cure. The two following cases illustrate the points I have brought forward:—

Case 16. *Reappearance of a cyst six years after its disappearance; cure of cyst by incision; local application of iodine solution and plugging.*—A single woman, aged 39 years, came to me in 1892 with a tumour in her breast which was believed to be carcinomatous. It had been steadily enlarging for two years, but as it occupied the same position as a "lump" which had existed in the breast six years previously, and had, after some months' treatment, disappeared, it was natural for the patient to hope that the same result would again occur. When I saw her, the tumour was the size of a large egg, very hard, and deeply situated and elastic, if not fluctuant, with the patient placed in the horizontal posture. I explored the tumour, and, finding it to be a cyst, sponged it out with a solution of iodine, plugged it, and let it heal by granulation. This patient was well three years later.

Case 17. *Cyst in the breast followed by its disappearance, and reappearance 30 years later with intra-cystic growths; operation refused.*—A married woman, aged 63 years, consulted me for a tumour which had been

gradually growing for two years in one of her breasts, and was then the size of a large egg. The skin over the tumour was somewhat fixed to it and slightly red. The nipple was retracted, but this had always been the case. In the course of three weeks the tumour burst, and a week later a sprouting growth projected from its interior which looked sarcomatous. The patient refused operation. It seemed that in this case 30 years before a lump had existed in the position of the present tumour, and under six months' treatment disappeared to reappear many years later in the form described.

I would here draw attention to the fact that only three of the last 16 cases which I have quoted occurred in women under 40 years of age, that seven were found in women between 40 and 50 years of age, and six in women over 50, two of these being 63 years of age. It is tolerably clear, therefore, from these facts that no argument can be drawn from age as to the probabilities of a tumour being cystic or otherwise, for such cysts appear in women during what is usually regarded as the cancerous period of life.

Group III.

The third group of difficult cases now claims attention, and in it will be included cases in which the breast gland appears to be either generally or in one or more of its lobes harder than natural, coarse, or knotty, the knots varying in size from small to large peas or nuts. In some of these cases, but not in all, there will be a discharge from the nipple of either a clear or blood-stained fluid, or some pultaceous, cheesy material, and this may be increased in a majority of instances by pressure on the gland. Occasionally this affection is complicated with some enlargement of the axillary lymphatic glands. These cases are mostly found in women who have passed the period of, or who have long given up, child-bearing, and the condition is in a measure physiological, for it is one of involution of the gland associated with some cystic degeneration of the ducts and acini. In a general way it is not to be regarded with apprehension, although in exceptional instances the condition lights up and becomes pathological by some of the cysts enlarging and forming tumours of either a simple cystic nature or becoming the seat of intracystic growths, papillomatous, sarcomatous, or carcinomatous. Such cases as these ought to be watched, for in all of them there is a spurious activity in the gland tissue, and if there happens to exist any special tendency in their owners to develop a new growth of any kind this spurious activity may

show itself in some pathological direction. In the bulk of cases soothing applications are of the most value. In others that retain their activity excision is to be advised. In connection with this group of cases Case 12, as reported, may be read again with advantage with the following examples :—

Case 18. *Cystic disease of the breast with intra-cystic growths ; excision of the gland ; recovery.*—A married woman, aged 40 years, the mother of two children, both of whom she suckled, consulted me for a tumour the size of an egg which had been slowly growing for nine months. There was no discharge from the nipple. The whole gland was coarse and knotty, and the tumour was situated in the axillary half. I regarded it as one of cystic disease from its elasticity, and it was believed that the whole gland was more or less involved. I cut into the tumour and found it to be a cyst containing papillomatous growths, and made out that the whole gland was similarly affected. I consequently excised the gland and a good recovery ensued.

Case 19. *Cystic disease of the breast, with intra-cystic papillomatous growths ; excision of gland.*—A married woman, aged 60 years, consulted me in 1888 for a tumour the size of an egg, occupying the axillary half of the left breast, which had been growing for about six months. It was elongated in shape, hard, and elastic, and I regarded it as a cyst, but the whole gland felt coarse and knotty. At times there had been some discharge from the nipple, which was blood-stained. Later I explored the growth and found it to be of a cystic nature, with intra-cystic growths, which Mr. J. H. Targett, the pathologist of the Royal College of Surgeons of England, described as not containing any definite malignant tissue. The larger tubes of the breast were in all stages of dilatation, and in some of these tubes the same growths were present. A good recovery followed. This patient was well six years subsequently.

Case 20. *Cystic disease of the breast with retracted nipple simulating carcinoma ; removal of gland.*—A married woman, aged 53 years, the mother of ten children, consulted me in August, 1895, for a tumour in her right breast which had been growing for nine months, although her husband maintained that a lump the size of a nut had existed near the nipple for at least 20 years. She had had with her first child an abscess in the breast, which was opened in the axillary lobe. The nipple had been retracting for six months. When the patient was seen it was quite inverted. The breast was lumpy beneath the nipple as if from cysts ; its axillary lobe was also thick. No large glands were in the axilla. On exploration being undertaken on August 10th, the tumour was found to be cystic. The cysts were full of thick cream-like paste. Excision was performed and a rapid cure followed. Mr. Targett reported to me on the specimen as follows :—"The breast shows a number of small retention cysts besides the one which you incised. Some of them are quite close to the nipple, and they all contain the same honey-like material. Indeed, in handling the specimen before making any cut, I expressed a quantity of this material from the nipple. On section it was seen that this came from dilated ducts, particularly those ampullæ below the nipple. The breast tissue itself, where hard, is due to the presence of these small tense cysts."

In these three groups of cases to which attention has been drawn I believe the surgeon will be able to find a place for most, if not all, the doubtful and difficult cases which he must meet with; and if he will carry to the bedside as a rule of practice the thoughts and methods of investigation to which I have directed attention, I feel sure that his difficulties, which have been my difficulties, will be found to lessen, if not to disappear. At any rate, of this I am fairly sure, that he will be able in most cases to form a working diagnosis upon which he will be justified in deciding upon and carrying out a line of treatment which must conduce to his patient's advantage and to his own credit.

Mr. Marmaduke Sheild commented on the importance of the subject from a surgical and diagnostic point of view. He said the paper was of value not only on account of the excellent classification, but also because it contained the accumulated experience of a long series of years. He noticed that the author used the term adeno-sarcoma, mentioning the clinical characteristics by which the surgeon could diagnose it. Having for some time investigated the literature of the subject, one thing had struck him forcibly, viz., the difficulty of diagnosing a tumour of the breast to be sarcomatous or otherwise. On looking over the records of such cases he had found that a large number of tumours of the breast described as adenomata, even after microscopical examination, had ultimately shown sarcomatous characteristics, and had recurred *in loco*. He thought, indeed, that it was often a matter presenting insurmountable difficulties to say from microscopical examination, and still less clinically, whether a given tumour of the breast was adenoma or sarcoma. Take, for example, a woman about 40 years of age with a fairly rapidly-growing tumour, dating from three or four years, obviously not cancerous. It was removed and examined microscopically. If such a tumour were removed from a queen or an empress, none would be bold enough to say whether the tumour would recur or not, unless it were hard fibro-adenoma. It was very difficult, even with the aid of the microscope, to say definitely whether a non-cancerous tumour would recur or not, and this difficulty was even greater when only clinical evidence was available. Passing on to the subject of mastitis he said he should like to have heard something from the author as to the treatment of cases of chronic induration of the breast, whether by strapping and mercury, or by the remedy sanctioned by Sir James Paget, viz., large doses of liquor potassæ. He had always had an idea that a large number of these cases of induration of the breast were syphilitic. He could not say what proportion, but a certain number, especially in married women, disappeared under the administration of the mixed iodides, and pressure. As to the diagnosis of cysts of the breast he said he would go somewhat farther than the author. Mr. Bryant had stated that in a number, elasticity and fluctuation could be detected, especially if the patient were placed on the back. He himself had seen a large number of such cases in which he had not been able to make out either of these signs, and he pointed out that cysts might be so tightly distended that neither elasticity nor fluctuation could be elicited. If he found a hard lump deep in the

breast he always suspected a cyst, in the absence of evidence to the contrary. In respect of the simple incision recommended by the author, he remarked that many patients objected to the scar which it left, and he asked what reason there was for not dealing with simple serous cysts by aspiration and injection. He recalled that Brodie used to teach that these cysts should be treated by rubbing with liniment and by counter irritation. It was important not to leave a scar on the breast, especially in young women. He had seen a great many mistakes made in the diagnosis of cysts of the breast. He mentioned one or two of his own by way of illustration to show that mistakes were possible, even after using a trocar. He referred to the case of a patient 40 years of age who had a hard lump in the centre of the breast which he admitted he thought was a cyst. He punctured, but nothing came out, so he removed the breast, and then he found that the cyst had very thick walls and contained a hard, putty-like material, in fact it was evidently a thick-walled galactocele of long standing. Commenting on the spontaneous cure of cysts, he observed that this was a question of considerable importance, because it was just such cases that recovered under this or that quack treatment. He said the author had made no mention of dermoid cysts of the breast, and he asked whether he had ever met with an example. Personally he had serious doubts as to the existence of this variety of cyst in the breast. Such cysts usually occurred in the median line of the body, and most cysts of the kind he had seen or read of had turned out to be sebaceous cysts of the skin which had passed deeply into the substance of the breast, or else old galactoceles.

Dr. Snow mentioned a case that had come under his notice 15 years ago, from which he had learned a good deal. The patient was an intelligent woman who had previously been examined by one of the most eminent surgeons of the day. She then presented a lump which she was told was not a cancer but a cyst, and the surgeon in question had even lectured on the case, pointing out the features which distinguished a cyst from a cancer; subsequently incising and dressing from the bottom. The wound never healed, and later the patient had applied to him with a fungous protuberance from the spot, the whole breast-tissue being then in an advanced stage of malignant infiltration. The surgeon had overlooked the almost universal association between cysts in the breast in a woman advanced in life, and malignant disease. He explained that, in view of mammary new-growths, he divided the life of a woman into three periods, first that of development from 14 to 25, at which age one rarely met with cysts; then the period of maturity between 25 and 34 in which also tumours were comparatively rare; lastly, the period of devolution from 34 onwards. After that age every tumour in the breast, whether cyst, fibroma, or of any other species, in his experience sooner or later became associated with malignant development in one form or another. The lining epithelium of the cyst eventually gave rise to carcinomatous intra-cystic vegetations (the "duct-cancer" of some pathologists); then, too, there was a great deal of connective tissue which gave rise to vegetations of the sarcomatous type; and, thirdly, ordinary scirrhus often arose within the thickened walls, or in the parenchyma immediately adjoining these. A breast-cyst might also, as probably in the case above quoted, be consecutive to a primary carcinoma. He admitted that the author had been very successful with simple incision and packing with gauze. Personally he had always dissected the lesion out, and never once had he discovered that he had

removed a simple cyst, but that the whole breast was undergoing cystic degeneration. Only one or two cysts might be brought to light, but very numerous others of less size pervaded the whole breast tissue, and were prone to give subsequent trouble. He insisted on the fact that a cyst in the breast of a women at that period was not a simple condition, but a disease of the whole parenchyma. He referred to three cases he had just reported in the 'Lancet,' in which one breast was excised for cystic degeneration, and two or three years afterwards the other organ became similarly affected. He had never seen any growth in the breast which, once cystic, had ever disappeared; but such, if near the nipple, might be emptied from time to time, and it was also possible that in an organ which was overlaid with fat, the lesion might very easily be overlooked. As to the quality of the fluid exuded, he urged that this was not an absolute guide to a distinction between malignancy and non-malignancy. He had seen far more cysts in connection with malignant disease associated with the discharge of straw-coloured or pale fluid, but he admitted that a red colour was always an ominous sign.

Mr. Turner asked the author if he had ever seen a sebaceous cyst of the breast. He himself had met with such a cyst some years ago in the wife of a medical man who had already consulted two experienced London surgeons, one of whom gave it as his opinion that it was malignant, while the other gave a guarded diagnosis. It fell to him to remove this tumour, and it was most distinctly a little sebaceous cyst, it had not the appearance of being dermoid. The patient was a lady about 30 years of age who had had children, and the growth only dated from a few months. The author had thrown some doubt on the alleged disappearance of sarcomatous growths. He himself could not help thinking that he had seen such a case, which, indeed, he had brought before the Clinical Society. It was a sarcoma of the thyroid gland, with no cystic formation, and no suppuration. He was called upon to do a very low tracheotomy, so low that he had to introduce a No. 12 gum catheter. After that the swelling almost, if not entirely, disappeared. Then it recurred, and once more he cut down and removed a portion which was examined microscopically and was declared to be sarcomatous. The woman died a year after the first operation, and on *post-mortem* they had found a distinct though small sarcomatous growth of the gland. He said that there were a large number of cases on record in which sarcomatous tumours were said to have disappeared. He agreed, however, that many of these cases might not have been sarcomata at all, but merely inflammatory.

Mr. Bidwell referred to two cases recently treated by simple aspiration which had not refilled. He thought this fact was suggestive of the possibility of spontaneous cure, because the mere tapping could not in itself be curative. In respect of the author's treatment of cysts, he asked what were his indications, whether for excision or for swabbing the cavity with iodine and plugging. With regard to the fluid exuded from the nipple in cases of cystic growth, he said he was inclined to agree with Dr. Snow that a discharge of clear fluid was not a proof that no malignant growth was present. He had seen two cases, where only clear fluid escaped, which proved to be malignant. With regard to the cases with retracted nipples and some localised inflammation of the breast, it seemed to him that the diagnosis in such cases was extremely difficult. He mentioned two cases, one of carcinoma, and one inflammatory, in which the similarity of the physical signs made it extremely difficult, if

not impossible, to make an accurate diagnosis without an exploratory operation.

Mr. Lockwood (*Vice-President, in the Chair*) mentioned two facts which he said had made a great impression on his mind. He said that one surgeon would certainly have been spared great humiliation if he had carried in his mind the rule advised by the author, viz., to cut into tumours of the breast. This surgeon had removed the whole breast, and on incising it he found it was a simple thick walled cyst. Another circumstance was, in a sense, an answer to a question asked by Mr. Sheild. Two years ago he had been asked to see a patient with ascites. Examination of the abdomen revealed the fact that this was due to growths in the liver and great omentum. The interesting point was that 10 or 12 years before she had had a cyst of the left breast treated by puncture and the injection of iodine, and there was at this time a considerable mass in the position of the cyst. He believed that the surgeon had then dealt not only with a cyst, but with a cyst associated with a malignant growth as well. He urged the removal of all such lumps under antiseptic precautions, for the operation was then practically devoid of danger.

Mr. Bryant, in reply, pointed out that his paper dealt only with the diagnosis of early cancer of the breast particularly associated with cysts. He had avoided going into the question of the differential diagnosis of adenoma and sarcoma, though he had incidentally touched upon the question. He instanced the case of a smooth unlobulated tumour in the breast of a young person, that such a tumour when hard and firm was probably an adeno-fibroma; and that when rapidly growing, soft, and succulent, an adeno-sarcoma. If the tumour was of rapid growth it probably contained spindle or round cells with little fibrous tissue, and still less of any glandular element. If it was of slow growth it was probably more fibrous. The examples of cysts he had brought forward were cases in which the tumour had been taken to be cancerous, and had been sent to him under those circumstances. In fact, cases in which the diagnosis had been given dogmatically as cancer. Under such circumstances the most prudent course of treatment was certainly to make an incision for exploratory purposes. In young women cysts were very rare, although they might be met with in young married women whose breasts had undergone involution changes at an earlier period of life than usual. As a rule these involution changes only take place in women past middle age. In such cases he partially agreed with the second speaker, as he believed that a coarse, knotty gland undergoing involution changes was prone in a small proportion of cases ultimately to become the seat of malignant disease. He declined, however, to go as far as to say that they would all inevitably undergo this change. Perhaps they would if the patients lived to 100, as he had seen cancer commence at 80 and 90. He was sure that it would be wrong to lead patients suffering from involution changes to believe that they would ultimately become the subjects of cancer, such a view was not correct. A small proportion of cases might undergo this change, but the bulk of them did not. Every surgeon had made mistakes in the diagnosis of cystic tumours, but so few of our younger brethren would learn from the mistakes of others, that it was still necessary to urge the importance of observing the rule which he had laid down. He agreed that the fluid of the cyst was not diagnostic of its true nature, but it was an assistance in diagnosis—if it was of a serous nature and the lining membrane of the cyst when cut into was smooth, the idea of the breast being cancerous is most

improbable. In the case mentioned by the Chairman, in which the breast had been tapped and serous fluid escaped, and a cancerous tumour subsequently appeared, it is probable that if the cyst wall had been carefully examined when the cyst was opened something in the way of growth would have been found to suggest that the cyst ought to have been more actively dealt with than by mere plugging, and that it should have been excised. He did not treat the majority of the cases recorded by simple plugging. Where the case was one of a simple serous cyst he plugged, but where the fluid was of a different character, or the walls of the cyst were unhealthy, or where the family history of the case suggested that there was a prospect of cancerous degeneration he always dissected it out, and wherever there was evidence of there being more than one cyst he removed the lobe, or even the entire organ. He had mentioned one case in which there were fine papillomata in the cyst, and this he removed. He had never met with dermoid cysts of the breast. He had, however, seen a dermoid tumour somewhat similar to the one described by Mr. Turner, which, if not dermoid, certainly contained fat which was not cutaneous. It was difficult to understand how a skin cyst could be deeply placed beneath the fascia if not dermoid. With regard to the treatment of cysts generally, that point was hardly under discussion. He might, however, say that if a cyst was present and was not giving rise to any trouble, he would leave it alone, with the hope that by and bye it might disappear. He knew of no treatment that assisted the disappearance of such cysts. He had in former years employed various means with the object of promoting absorption, but such procedures had never seemed to do any good, and sometimes they did harm, particularly puncturing the cyst. The scar left by an incision was very small, and when made to explore a doubtful tumour the scar became insignificant. In such cases as he had brought forward, when the incision was called for to determine the diagnosis of a cyst from a cancer few patients hesitated, and personally he had never encountered any difficulty in carrying out the practice.

January 13*th*, 1896.

PREVENTION AND TREATMENT OF INSANITY OF PREGNANCY AND THE PUERPERAL PERIOD.

By Geo. H. Savage, M.D., F.R.C.P.

The subject which I bring before the Medical Society to-night, being one in which both the specialist and the general practitioner are deeply interested, ought to provoke a good debate. The time at my disposal will not allow me to go over the whole field, and I must take it for granted that you all know the outlines of the subject. I shall give a sketch of the disorders which one meets with in these conditions, and I shall lay before the Society certain

moot points on which I shall hope to hear the opinions of those who have the practical knowledge, which may be wanting in me. I classify or divide my subject as follows:—

1. Insanity of Pregnancy—(*a*) Of conception; (*b*) Of the first few months; (*c*) Of the later months of pregnancy.
2. Insanity of labour—(*a*) Hysterical and transient; (*b*) Persisting after-labour.
3. Insanity associated with febrile symptoms occurring with the onset of milk.
4. Insanity following delivery within 14 days—(*a*) Septic; (*b*) Non-septic.
5. Insanity coming on between the fourteenth day and six weeks after delivery.
6. Insanity of lactation or of weaning.

In studying disease it is interesting to group certain disorders which, though differing in form yet agree in arising under similar conditions. Such etiological groupings may not be natural, but they are convenient. We have to-night to consider such a group. It is noteworthy, at the outset, to remark that persons who have suffered from one of the above-named forms of disorder are very liable to suffer from either of the other forms, so that a woman who has had an attack of puerperal insanity after delivery is very likely to break down during pregnancy, or after weaning in a subsequent pregnancy. The form of insanity which may have been present in the one attack is likely to recur in the other attacks which may have arisen at other periods of the pregnancy, so that a woman who has mania after delivery will very probably have mania when she becomes insane after suckling. There is no definite *form* of insanity which deserves the name puerperal mania; we meet with mania, melancholia, dementia, delusional insanity, and even general paralysis of the insane, in connexion with the puerperium.

Next, as to the conditions which are to be looked upon as predisposing causes, for out of the many women who are delivered but very few break down mentally. Neurotic heredity of a special kind plays the chief part. I believe it will be found that there are varieties of neurotic heredity, some following the tendency to break down at the critical sexual periods, while others tend only to break down with secretory or excretory disorder,

such as gout, &c., while a third group exhibit nervous weakness only with degeneration due to age. Insane parentage, especially if the insanity come from the mother, is very fruitful of danger, and I have met with a good number of instances in which both mother and daughter have suffered from puerperal insanity. We must not altogether exclude from such cases the effect of expectation, to which we shall again refer when speaking of recurring attacks in the same individual.

I think the woman who has had insanity with the onset of menstruation, or who is nervously unstable at these periods (to an abnormal degree) is very liable to puerperal insanity. I should, on the other hand, like to hear the experience of those present as to whether they have frequently met with cases of puerperal insanity among those who in girlhood have suffered from grave hysteria. I have been surprised to meet with so very few such cases among the sufferers from puerperal insanity.

To sum up my experience of these cases I would say that neurotic heredity, specially if on the mother's side, is very dangerous, but that few puerperal patients have had previous attacks of insanity, and hardly any have suffered from grave hysteria. I have spent a good deal of time on this point, for it is the first really serious question which has to be faced in the prevention of puerperal insanity. Some think marriage a kind of panacea for all feminine complaints, whereas others would prevent every girl who has had any nervous breakdown from marrying. My judgment is, that to marry neurotic people on the chance of curing the neurosis is a very serious and unjustifiable act, whereas to condemn every hysterical girl to singleness would add greatly to increase of insanity.

Marriage rarely does any good in highly neurotic persons, and of course the danger to offspring depends on the instability of temperament of the husband and wife, and their being in any way related by blood. Advice can only be given by carefully studying the hereditary development and social conditions of the contracting parties, and no fixed principle can be laid down further than, that persons who have had attacks of insanity are likely to have others, more particularly if they come of neurotic families; but one cannot say that even with insanity in the family the offspring need be abnormal in any way. Mental disorders occur more frequently with first pregnancies than with later ones. The

danger is greater the less physiological the age of pregnancy; thus, a pregnancy occurring for the first time after the age of 30 in a neurotic woman is fraught with great danger.

It is still a question with me as to the relation of illegitimate pregnancies to insanity. I have probably not had enough experience of such cases, but I own that, contrary to my expectation, I have met with but few cases of insanity following such. It may be said this (if true) depends on the fact that the majority of those who thus fall are of ruder fibre, and not likely to break down in the same way that more conscientious women would. We know that lives of apparent hardship do not necessarily tend to insanity, thus the beggar suffers less than the more refined and responsible citizen, and so I understand that the cases of illegitimacy producing insanity are rare in the great metropolitan asylums.

The most serious predisposing cause is a previous breakdown from a similar cause, just as I said, that the fact of a mother having broken down leads often to the daughter's failing too, there being added to the neurotic habit, expectancy, which is very potent for evil. I think the danger of expectancy is to be measured by the recency of the former attack, for time is a great deadener of even such dreads as this. I have experience of several women who have, after an interval of years, borne healthy children without any fresh attack of insanity. Lives of indolence and luxury are predisposing causes, the rich suffer more than the poor. It seems likely that blood poisoning in one form or another is a cause, and that during periods when epidemics are about, puerperal insanity will also be more common. Physical causes are more powerful than moral ones. It is noteworthy that some women seem to break down when pregnant with a child of one sex, thus with male or female children only the insanity may follow. The exciting causes may be simple, such as the pregnancy, the delivery, and the like, or they may be mixed; thus a pregnancy with death of child or husband, accident, injury, twin pregnancy, or alcoholic excess. The giving of an anæsthetic may be an associated exciting cause.

Insanity of Pregnancy.—I believe this is more common than is generally acknowledged; it is so often slight and transient, and often does not call for any medical interference. The vagaries of the pregnant woman are accepted and allowed for, many

symptoms, which really have to be looked upon as incipient insanity, occur in pregnancy, and may pass off or may develop into the full-grown disease.

It is important from this point to study some "*Longings*" of pregnancy; such may be insane from their nature or from their degree, and I have had the opportunity of noting that the children born after a pregnancy with very pronounced longings may be abnormal, whereas the same mother may have pregnancies without such longings, and have children who are normal. The longings grade from simple distate to food to delusions that the food is poisoned; from restlessness with irritability of temper to unbearable jealousy, from liking for peculiar articles of food to dipsomania. Longings of pregnancy may represent insanity or may be the first step towards it.

The insanity of pregnancy is divided into that which comes on during the earliest months and that of the later months, and I must, in passing, refer to the insanity of conception. I have met a good many doctors, including obstetricians, who doubt the possibility of any woman being able to tell when she has become pregnant, that is, within a few days or weeks. I should be inclined to bow to their decision, but that I have so commonly been told, by women, that they knew at once when the pregnancy took place by some strange feeling, or loss of feeling. I have met with women who, having had previous attacks of puerperal disorder, have come to me asking if anything could be done, for they knew all depended on their being pregnant, and that their knowledge was almost suddenly acquired. I would add that I know the sudden alteration in feeling which may follow with the onset of the catamenia, and I cannot see why as sudden a change should not follow a physiological change so far reaching as pregnancy. In some women suffering from melancholia physical health is restored, but there remains melancholia with deadness of feeling, which may suddenly pass off with the onset of the catamenia.

The mental disorders which amount to insanity which occur during the earliest months of pregnancy are mostly disorders of appetite or of feeling. They are rarely maniacal, or in any way associated with sensory disorder, such as hallucinations. Melancholia, with dread of some evil about to happen, with suicidal and infanticidal tendencies, are common. These cases

may vary in gravity, from simple depression to intensely suicidal melancholia. There may be, on the other hand, hysterical disorders of an aggravated kind. In all these cases coming on during the earlier months, the less done the better beyond removal from old surroundings and friends, return to the old home and to the mother may be of service. One thing I cannot advise, which is the induction of premature labour, for I have never seen any good follow it, and I have seen insanity follow abortion or induced delivery. The general treatment must depend on each individual case.

As to insanity which comes on during the later months of pregnancy this differs considerably from that last noted. It is, as a rule, much more grave; it most commonly takes the form of melancholia with suspicion, there are ideas that the husband has got tired of his wife, that she is in the way, that he is keeping some other woman. Jealousy is common, and there is danger to the children, if there be any. The general physical state is, as a rule, one of nervous exhaustion with bad nutrition, defective excretion and secretion. In these cases, again, I would say that, in my experience, induction of premature labour is not to be recommended as far as the mother is concerned; the question of the offspring is one which I think we have not to consider, for we know so little as to heredity, and I can, from experience, speak of women who, having been insane when they became pregnant, and having remained so during the whole time of pregnancy, yet have produced normal children, who have for years been under my observation, remaining healthy. It is important to remember that women suffering from insanity of later pregnancy do not improve with delivery at full term. The insanity passes, as a rule, from the insanity of pregnancy to puerperal insanity, so called.

Women suffering from insanity of later pregnancy pass through labour naturally, as a rule; there may be a slight temporary improvement, and this is a fit place to refer to some cases in which during labour and shortly after, the mental sky clears for a time. I have met with several cases in which insanity occurred through a longer or shorter period of the pregnancy to be replaced by sanity and full recognition of the past illness during labour. The sanity remaining for a few hours after complete delivery again to be replaced by the old delusions or depression, which continued for weeks after.

Insanity starting with delivery is rare, but I have met with some cases in which the hysterical excitement which is not uncommon during labour has persisted for hours or days after the completion of a normal delivery. I cannot trace any definite connexion between puerperal eclampsia and insanity, but I have met with some cases in which the convulsion has been followed by insanity, and such cases seemed not to differ from ordinary ones of puerperal insanity.

The next form of disorder to which I would refer is that which may occur with the onset of milk, when with some increase of temperature, and perhaps a rigor, there is marked delirious excitement; this often gives rise to great anxiety, but if the state of the breasts be looked to it is pretty certain that a purge and some simple hypnotic will effect a cure. These cases lead to infanticide more often than to suicide. Though the majority thus rapidly recover, yet in some cases the febrile disorder leads on to acute delirious mania, which may rapidly prove fatal, and it is these cases which cause great difficulty in the diagnosis between insanity started by simple febrile disorder, and that following sepsis.

It is almost unnecessary for me to say that the physician must not neglect the lactation in puerperal insanity, I have met with a good number of instances in which such neglect has led to serious delay in recovery of physical health after the mental storm has passed.

The next branch of my subject is that of true puerperal insanity. This is the form which is met with so often in general practice, and it is so well known that I shall not dwell very long on its symptoms. There are two distinct forms, one depending on some sepsis, the other not. The former, as a rule, is very unfavourable, though the danger is not greatly increased by the presence of mania. In this particular again, one's common sense is wrong. I expected to find that every case of puerperal insanity, in which there were evidences of septic trouble would end fatally, but I have been agreeably disappointed, when abundant alcoholic stimulation has been tried. The form generally assumed by septic puerperal insanity is that of mania, though there may be more mental confusion than pure mania in some cases. The mania may be looked upon as an epiphenomenon in these cases, but for my own part I can say that I have seen more than one case in which

septic symptoms seemed to arise in part from expectation. Thus one sister died of septic puerperal fever, a second sister nearly died with symptoms of a similar kind a year after, and a third sister had a very good mimicry of the other cases, including suppression of secretions and excretions with rigor, and petechial rash a year later again. These belonged to a neurotic family. I have already pointed out that the cases which come on within a short period of delivery are mostly maniacal. These include the septic cases, but there are a large number of maniacal cases which have no septic origin, which come on with emotional disorder of the hysterical type, I need not describe these symptoms beyond pointing out that among the most constant is sleeplessness, or sleep much disturbed by nightmare. In some cases this latter colours the nature of the succeeding disorder, after the sleeplessness comes dislike to husband, child, and nurse, with accusations of neglect against the latter, then may develop marked hysteria, or profound depression. I do not find that the orthodox chloral and bromide does much good, though all but universally given in the treatment of this disorder, I daresay I shall be asked what else can one do, and I fear I am but a blind leader of the blind, but I prefer to try other measures, such as free purgation, a thorough clearing out of the uterus, and general measures, including the use of alcohol before going in for the regular chloral and bromide treatment. It is very rare for an attack of this kind to be *cut short* by other means. There are some very important questions which arise at this place. First, which patients should be treated at home, and which must be sent to an asylum. I quite agree with the general feeling that a puerperal case should not be sent to an asylum, especially if it be her first attack of insanity, unless it is absolutely necessary; it is all very well to say that the asylum is the best place for such cases, and I believe this may be the truth. But there are other things to be considered.

First, if the woman recover, believing she has only had brain fever, she may have other and normal deliveries, whereas, if she has been sent to an asylum there is no loophole for self-deception, and, if again pregnant, she looks to the inevitable breaking down, and I have known one woman have eight such attacks. Next, surely there are many houses where a medical man, assisted with trained nurses, may lead his patient back to health. I know it involves

great worry and anxiety, and the time needed taxes the energy of the doctor and the purse of the patient, yet I believe a majority of puerperal cases in England are brought to a successful issue at their own homes. If treated at home the next question is the withdrawal of the child, this is almost always done for the good of the child, and for fear of infanticide, and though there are many cases in which the suckling gives relief and sleep to the mother which nothing else will provide, I cannot advise that it should be tried. The child and the husband must be got away. The husband often is a source of great worry, for his insane wife, with emotional weakness, seems, according to him, never to be so quiet as when *he* is near, this may be true for a time, but the moral evils are many. Thus, eroticism is commonly developed, and the once pure wife seems to the husband to have become impure. Absence of female relations is also needed, then feeding, rest and quiet with plenty of pure air, the only medicine I recommend is some form of hypnotic which would be varied frequently, nourishing food and stimulants, according to the habits and the physical state of the patient. Patience is the real requirement, I cannot find that the majority of my cases of acute mania following delivery recovered under four months, and in many cases this period was greatly exceeded. In nearly all cases of puerperal insanity there is a marked period of depression or mental exhaustion, which follows the period of excitement. In my experience this is the time needing most skill for treatment. The brain seems in these cases to have passed through a plastic stage, during which it has accommodated itself to fresh surroundings, and there may be great difficulty in getting the patient to express any wish to return home; I would compare these cases to the surgeon's failures which are cured by the bone-setter.

Mental adhesions have been established which require rather vigorous breaking down. A time comes when every puerperal case should be moved either from home to a strange place, from an asylum to home, or to another asylum, or from the parent institution to the convalescent home. Many is the case which I have seen rapidly cured after such removal. In many cases after acute mental disorder there is amenorrhœa and with this apathy, loss of will, loss of active affection, and general indolence. I do not think that iron alone is of service in these cases, and the use of

permanagate of potash is doubtful. I find the return to home of vastly greater service, but I know that I shall have sceptics here, for I have to say at once that return to home without home life is worse than useless. I send wives home and tell the husbands that they are to cohabit but that there must be no pregnancy. Some purists may object, but it is the question of what is best for the patient that I have to deal and for whom I must act. Return to home and home-life is in the curable cases of vast importance. Of my cases, 25 per cent. did not recover, some dying, and nearly 20 per cent. remaining chronic lunatics. It is necessary to repeat that there may be other forms of mental disorder besides mania, and with each there must be appropriate treatment. In the cases which come on after the first 14 days the larger number are melancholic or, at least, depressed and confused; these are nearly all physically weak, and need, first of all, rest and nourishment. I believe that there is more danger from suicide with these cases than is usually recognised. Infanticide also is a danger, for in many cases the mother has delusions in reference to her husband, and thinks the children will be better in Heaven than left to him. The duration of the melancholia is generally several months, and I think it will be found that these cases take rather longer to recover than do the maniacal cases; in these cases, too, there is frequently marked bodily improvement some time before the mind begins to recover, so that the rule-of-thumb law which says that in mental disorders if bodily health improve before mental the prospect is bad has to be discarded, for I found that nearly always the body improved first. After the acute stage there is a period of indolent fatness, with amenorrhœa. In this state it is important to change the surroundings frequently, and to try the effect of home. If left too long in an asylum at this period the patient gets contented and does not desire to return to her duties. Some of these cases never recover will-power, and a certain number pass from the earlier stage of mental disorder into one of moral weakness and perversion, so that a moral woman may become sensual, intemperate, or a kleptomaniac.

It may surprise some of you to hear that general paralysis of the insane may arise during pregnancy, or may be associated with it in various ways. I have known the earlier symptoms of general paralysis arise in the earlier months of pregnancy. I have also known them develop after delivery, and I have known a second

pregnancy follow and run a normal course in general paralysis. In such cases the general paralysis does not appear to affect the course of pregnancy or of the delivery, though I think the risk to the offspring is greater. It may be well in passing to give my experience of the children born of mothers who have had puerperal insanity, and I think it very important to remember that there seems to be almost as great a danger of the child being affected when the mother has broken down after delivery, as when she has been insane during part or the whole of her pregnancy. There is no reason why a woman becoming mad after delivery, and remaining so, may not become pregnant and have a perfectly normal child.

The subject of the insanity—of lactation and of weaning—is interesting, because according to some authorities the lactation is the cause, and according to others the weaning plays the chief part. I believe there are two distinct groups—first, those neurotic women who become very weak and break down with melancholia, or partial dementia or delusional insanity, and, second, those who, giving up suckling from some cause, become upset and develop suspicions and delusions. In both groups the treatment must be the same: removal of child, change of surroundings, generally—but not always—removal of husband. Tonics, iron for choice, with good food, alcoholic stimulants, and probably some hypnotic. It has been suggested that bromide with quinine acts well.

The cases coming under this head are, in my experience, the most curable of all, and I look to 70 or 80 per cent. recovering, and the recovery is often within two months.

And now, Mr. President and gentlemen, I feel that I have laid before you a heap of ill-digested facts, and I have left them for you to digest or reject. I speak as a mental specialist wishing to learn whether my experience is similar to that of the obstetrician and the general practitioner. I know there are many reasons why my experience should differ from theirs, for my chief knowledge of these cases was gleaned at Bethlem, where naturally only the most acute cases were seen, and in consulting practice I have been surprised at the rarity in which my opinion is sought in any cases except those in which the question of removal to an asylum is raised; so I know there must be a large land of which I know little, but which is cultivated by you, and I want to see the products.

The subjects I consider most deserving of your notice are:— The causation of puerperal insanity, the relationship of hysteria and adolescent insanity to puerperal insanity, and the advice to be given as to the marriage of neurotic persons and, further, the advice as to such people having families. I believe that my remarks upon the frequency of mental (and moral) disorder in pregnancy and the relations which this bears to longings of pregnancy are worth discussing. I want very express opinions as to the propriety of induction of premature labour in insanity of pregnancy. I maintain there is no special form of insanity deserving the name puerperal mania. I point to the part played by heredity and by previous attacks; I insist on the grave weight of expectancy in these cases. I want to know the experience of those present as to special danger in illegitimacy; this is very important from the medico-legal standpoint. As to insanity of labour, my audience probably knows more about it than I do. The true puerperal insanity, in my experience, is a disease of weakness following normal births, though, perhaps, predisposed to by hæmorrhage and twin birth.

Septic trouble may play a part, and there is great difficulty in distinguishing between cases of septic puerperal mania and delirious mania due to ordinary emotional causes.

The treatment of puerperal insanity is first to be considered from the certifiable and the uncertifiable points of view, from asylum and home treatment, and I want a very strong expression of feeling on this. Next, when patients have partly recovered, I think return to home should be insisted upon sooner than in other cases. I agree with Clouston, who says that in these cases recovery once started rarely stops; therefore, change home can be made earlier than in ordinary cases of insanity. I advise frequently change of conditions if recovery does not advance, and I recommend home and cohabitation with precautions.

And now I conclude this paper feeling that the subject is one of the most importance which can be brought before a Medical Society, for in the proper treatment of these cases depends the life and happiness of many more than the patient.

The PRESIDENT said his experience of the insanities of pregnancy and of the puerperium was somewhat archaic, for he had not seen a case for the last 12 years. He could, therefore, only discuss these cases in the light of modern science or recent experience. This, however, he might

say that while the author had tried to reduce order out of chaos, they would all carry away the impression that there was still a good deal that was vague, and that much investigation was required by the methods formulated by Dr. Andriezen, who had done so much to elucidate this subject, and Dr. Robert Jones. He confessed his inability narrowly to criticise the author's classification of the cases. It was doubtless useful and practical, but it was certainly not strictly scientific. It had an etiological basis, a symptomatic basis, and a time basis, and the author actually distinguished one class of cases by saying that they occurred within the first 14 days after labour. That recalled the definition of Professor Laycock, of Edinburgh, of an acute disease, viz., that it was one which ran its course in 14 days. It had fallen to his lot to examine a gentleman, a Mr. Jones, of Texas, to whom he put the question : "What is acute disease?" and the candidate replied that an acute disease could not be defined. The Professor said he ought to know that it was a disease running its course in 14 days, to which Mr. Jones rejoined, "Sir, an omnibus runs from Edinburgh to Leeds in 20 minutes, but that is not a definition of an omnibus." Classifications based on duration were exceedingly apt to prove misleading. The septic group, on the other hand, was a distinct and remarkable group, and these, he thought, ought really to be specially described under the title of puerperal insanity. One used frequently to meet with typical cases in asylum wards—women with flushed faces, beautiful complexions, animated countenances, and restless manners, cases in which there was arrest of the lochia with blood poisoning, and a high temperature. This was one of a group of cases which, no doubt, had diminished of late years. In the old days, when midwifery was less carefully conducted than at present, such cases were comparatively common, and he attributed the decrease in that class of cases to the greatly increased cleanliness and care with which midwifery cases were now conducted. With regard to the cases of insanity of pregnancy the author must excuse him if he regarded the statements of the ladies made to him, that they could definitely fix the period of conception to a day or even to an hour as somewhat apocryphal—indeed, the belief that they could do so might well be one of the symptoms of that incipient insanity from which they were suffering. From a physiological point of view he could not admit that the union of the spermatozon with the ovum was anything but a trivial circumstance in cell life, not nearly as important as the phagocytosis that was constantly going on in many tissues. There were other points he would have liked to discuss—the question of the influence of illegitimacy, for instance. In reference to that subject he would probably have joined issue with the author. He would point out that while the moral condition of women during illegitimate pregnancy might conduce to disturbance of the mental equilibrium, the women who fell in this way were often endowed with strong animal passions, and with the physical vigour with which strong animal passions were generally associated, and were, therefore, not so prone to insanity as the decadents and degenerates who did not succumb to the healthier forms of vice. He thought the author had shown himself too apt to seize upon the prominent fact of the pregnant condition, and to regard all forms of insanity occurring under these circumstances as etiologically connected therewith. He pointed out that a woman might have measles or pleurisy during the puerperium, yet one did not call it puerperal measles or puerperal pleurisy on that account. He himself recognised two great groups of cases, one dependent upon changes in the

blood, the other upon changes in the nervous system, occurring in women of an essentially nervous disposition, yet in intensely neurotic women the puerperal condition did not necessarily result in overthrow of the nervous system. He recalled the cases of two girls, both of whom had bad attacks of hysteria. He had ventured to foretell mental disease in the event of child-bearing. Both, however, married, and both had several children without trouble of any kind, though one of them went wrong at the menopause. It had interested him very much that his prognosis in both these cases had proved erroneous. He could not, however, do otherwise than congratulate the author upon his paper, which contained the results of many careful and interesting observations.

Dr. Blandford said the author had not told them that according to the statistics of the best observers these were the most curable of all the forms of insanity. According to Bevan Lewis and Clouston, at least 80 per cent. of these puerperal cases recovered within a comparatively short space of time. He did not think that any other form of insanity would show such statistics as that. They must remember, moreover, that their statistics were based upon patients admitted into asylums, and these it might be presumed were all severe cases. If they could get the statistics of all the cases, including those treated at home, he had no doubt the statistics, favourable as they were, would be still higher, and that a larger number of recoveries would be recorded. He said that personally he had not found that girls who had suffered from mere hysteria were liable to puerperal insanity, but he had found that insanity after childbirth had followed previous attacks of insanity. There was one point which had been passed over by the author, namely, the sleeplessness which preceded these attacks. It was necessary for every medical man to observe very closely the amount of sleep of women who had just been confined. These puerperal attacks commenced with sleeplessness, and with regard to this to know the amount of sleep that a patient got was of the greatest importance. They were at the mercy of the nurse in respect of the information, for the patient could not be depended upon very much. He pointed out that there were some nurses whose very presence tended to prevent sleep. If the patient was sleeping badly after confinement, or slept less than she ought to do, then he thought that sleep produced by drugs might be of very great benefit, and believed that many cases could be cut short or prevented and the patient saved by the administration of a suitable hypnotic so as to procure sleep in the early stages. When there was no danger to life from the actual attack he thought the attack passed off quicker if no drugs were given at all.

Dr. Herman submitted that there was such a thing as puerperal mania, and its distinctive feature was its remarkable curability. He pointed out that pregnancy and childbirth were the greatest mental strains a woman was called upon to go through. There were many women who would not break down under ordinary strains who yet broke down under the strain of child-bearing. It was, therefore, a special form of insanity produced by a powerful though transient strain on the nervous system. Dr. Savage had referred to the practice of recommending marriage as a remedy for hysteria and nervous disease. He believed that there was no form of nervous disease in which marriage should be recommended. The social and moral effects of an unhappy marriage would do more harm than any physical effects could do good. There might be cases in which some nervous symptoms might be due to unsatisfied sexual desire. He knew

of no way in which that could be found out except by the help of the patient's mother. Another point was as to the albuminuria. He agreed that in most cases of the kind albumen was not present. There was abundant proof that after labours in which eclampsia had occurred insanity had followed more frequently, and in such cases albumen might be found. He thought he had sometimes cut short an attack of puerperal insanity by inducing sleep ; but he agreed that chloral was bad, especially if given night after night. If a sedative were required for long periods together, there was one sedative that was very slow in producing bad results, viz., alcohol. He had in cases of sleeplessness after labour given alcohol in full doses at night in order to procure sleep, and he thought he had sometimes thus prevented insanity. He had never sanctioned the induction of premature labour for the prevention or cure of insanity, but in adopting this course he admitted that he had been greatly influenced by Dr. Savage's teaching. The amenorrhœa that took place in the later stages of these attacks, he considered, was a provision of nature to spare the system a further drain, and not as a condition calling for treatment.

Dr. Robert Jones said the Claybury Asylum had only been open two years. In that time they had had 30 cases of confinement. He had put together a few statistics bearing on the occurrence of puerperal insanity, as they called it, of which there had been 60 cases out of 2,400 on the female side. He suggested that it must be of tolerably frequent occurrence, seeing that 1 of every 43 female lunatics became affected from this cause. Mania was far commoner than melancholia. Out of 43 puerperal cases, 31 had mania, and only 12 melancholia. Of insanity associated with lactation, there were 7 cases of mania, and 1 of melancholia. He pointed out that exhaustion had not very much to do with the melancholic cases. They had had 6 cases of mania associated with pregnancy and 4 of melancholia. The patients suffering from melancholia had been older than those suffering from mania. The mania cases were under 25 or 26, while the melancholic patients were over 30. It might have something to do with the strain of pregnancy, and the puerperium coming on in those who were past the earliest age. As to the curability, their statistics were of course incomplete, seeing that the institution had only been open two years ; but, of the number, 32 had recovered, and of the other 28, 15 might be looked upon as convalescent, though admitted since October. It could evidently only be in the event of a satisfactory marriage that marriage could prove of benefit. His own practice was mainly among patients drawn from among the poorer classes, while the experience of Dr. Blandford and others was more among the well-to-do. He said, however, that there were a great many girls in London who found the duties imposed on them by home life very irksome, and to them marriage might secure a much happier condition, provided the conditions were otherwise satisfactory. As to albuminuria he said that in the 30 confinement cases albumen was discovered in only two, and neither of these had convulsions. He had under his care at present two cases confined last week, one admitted at about the seventh month. This patient had puerperal convulsions of the Jacksonian type. She was convulsed mostly on one side, but was delivered at full term of a comparatively healthy child. There was no albumen in the urine, and she had not had any convulsions since. Another case had severe convulsions within 24 hours of the confinement which only chloroform could stop. He had tried everything with the object of procuring sleep, and had finally come back to chloral and bromide. Food and these

drugs gave together very satisfactory results. The author said that the earlier these patients were sent out of the asylum the better, and he encouraged the home treatment. He himself had always gone on one rule in the younger cases, viz., not to send them out until the menses reappeared, which was usually within from six to eight months after they had been confined. In the cases of so-called septic insanity that came from outside, it was quite the exception for these maniacal cases to show any elevation of temperature. If they were really septic, one would have expected some febrile reaction. Illegitimacy was rare in this association. They had only had two cases of insanity due to pregnancy in illegitimate cases. One would expect to find some in London, but, as a matter of fact, they bore but a small proportion to the total number of legitimate pregnancies that came in. He referred to the case of a patient at the Brentwood Asylum, who came in after the birth of her first child. After that she had eight other children, but was never brought to the asylum again. It was worthy of note, however, that five of these children became insane.

Dr. Lloyd Andriezen observed that one of the very important points in puerperal insanity was its curability, 80 per cent. of cases recovering. He thought that was a point which would help them very much in arriving at a philosophical conception of puerperal insanity in respect of a classification of insanities as a whole. There were two great guiding principles, the etiological and the hereditary factors. Where the individual was saturated from birth with vices of brain organisation, that person would readily become insane under ever so little stress, whereas if strong and healthy it required a very strong stress of circumstances, or serious bodily disease, to produce insanity. One could see where puerperal insanities would come in in such a classification. It was clear that most of the cases were produced by very strong stress, for indeed there are no stresses to which women are subject which are stronger than those of pregnancy and the puerperium. The circulation is disturbed, so is the respiration ; there are further the great floods of nerve currents issuing from the gravid uterus and its adnexa ; and there may be also stresses and troubles of moral or social origin. Further, a large quantity of nutriment had to be absorbed from the mother's blood for the rapidly-growing fœtus, and it told peculiarly on the physiology of the mother. These would suffice, in some cases at least, to produce insanity of a mild type ; and he would therefore put the puerperal insanities (at least some of them) into a class due to *predominant stresses of the environment which might therefore occur in an individual of comparatively healthy heredity.* In those cases, however, with bad heredity, it was, on the other hand, no wonder that in the earlier period of pregnancy—indeed with the mere psychical idea of conception—there should be sufficient cause to produce some form of insanity. With slight stress—physical, social, or otherwise, such people would also get insane, quite apart from pregnancy or the puerperium. To some extent such insanities might be compared to the insanities of puberty and adolescence. In cases which he had observed of actual mental disorder taking place during labour, of which he had met with four or five examples out of 120 cases of ordinary labour, the symptoms were in two cases well marked, and might be called insanity. In one they came on towards the second stage of labour, with the os fully dilated and the head pressing upon the perineum ; the patient began to hold incoherent conversations, there were also visual hallucinations to which the patient reacted, carrying on conversations with these

imaginary persons meanwhile, and these continued for about an hour after the birth of the child, after which she quieted down. In another case the woman, about an hour before delivery, during the most acute stage, also became quite delirious and incoherent, but had no special hallucinations. He insisted on the very great importance and gravity of the initial insomnia in the puerperal state when ushering insanity. As alienists, we knew that the predominant feature in the early stages of many insanities was prolonged and distressing insomnia, and so long as this lasted there could be no recuperation of the brain. It could not cause surprise if after the strain of gestation and childbirth, and perhaps lactation also, upon the nervous system, any loss of sleep made the brain of the mother give way. Sleep, therefore, ought to be procured at all costs, and by the use of strong drugs if necessary. He believed that a combination of sulphonal and the syrup of the hypophosphites was beneficial and preferable to other hypnotics; in any case it tended to avert the trembling and weakness which followed the prolonged use of sulphonal alone, and it gave refreshing sleep. With regard to the pathological conditions, they had not advanced sufficiently to be able to lay down a definite basis for the classification of all the various forms of insanity; etiology must be the handmaid of pathology in a natural and practical classification. There was no insanity special to the puerperal period worthy of separate recognition as a clinical entity. Many cases were of septic origin, and these, with the adoption of asepsis in obstetrics, are getting rarer. He had examined the brains of two patients who had died with puerperal mania of septic origin, and he had found the same condition of the brain as in acute delirium occurring in chronic alcoholism or in general paralysis, viz., intense congestion, with small petechial hæmorrhages and a peculiar waxy condition of the brain tissue, so that it felt greasy to the touch. The brain substance was easily lacerable, and there were very irregular and intense mottlings, both in the cerebrum and in the brain stem and bulb. Microscopically there was tremendous destruction of nerve cells with pigmentary degeneration, and abundant deposition of fat and plenty of debris; in fact, the same appearances as those noticed in cases of subacute septic poisoning with pyrexia, so that they might look upon these as cases due to some toxic influence. These formed a septic group, etiologically and pathologically. It would really seem as if the puerperal insanities must be split up into many kinds, different in causation, in nature, in prognosis, and in pathology, each needing, therefore, its own proper place in a natural classification, the bond of pregnancy and the puerperal state which bound them together being often only superficial and non-fundamental.

Dr. Leith Napier said it was almost impossible to imagine an insanity of conception unless the patient were so predisposed that any slight perturbation would cause the overturning. He had had under his care three cases of insanity of pregnancy which took the form of mild delusive insanity, never revealed except to the husband and intimate friends. One of the patients had had five children. There were no neurotic symptoms, except with her first child. In 1887 she again became pregnant, and she then formed delusions with respect to her purity. He was somewhat surprised at the proportion of confinement cases in which Dr. Andriezen had witnessed symptoms of insanity, 1 in 60 was a large percentage. He could understand a condition of acute excitement during intense pain, but he could hardly conceive of the proportion being so high. As to the influence of chloroform one would have thought that

the less pain the patient suffered the better would her prospects be, but he recollected a case occurring not long since in which a lady delivered under chloroform developed insanity sufficiently grave to oblige her to go abroad for a time, and she always complained that she had been poisoned by the chloroform. He wished to emphasise the fact that there was a special form after delivery, viz., the septic or toxic form. One such case had made a strong impression on his mind some years ago. The patient was confined on June 29th, labour was simple, but on July 7th she was upset by the visit of a friend in a state of intoxication, and on the 12th she became violently excited, screaming, biting, &c. Believing that all cases of acute mania were associated with some form of pelvic inflammation, he examined her and found much swelling in the cellular tissue on one side of the uterus. He thought that possibly the case was one of a still more important class, viz., those associated with pre-existing pelvic suppuration which had been the cause of the sepsis. He had seen her on the 12th, and she was apparently reasonable, but her delusional state was well marked. She died on July 14th, her pulse being then 140 per minute and her temperature very high. He had no doubt that had proper operative treatment been resorted to, her life might have been spared. There was at present a case at Bedford which he had seen in consultation two or three months ago, illustrating another type of puerperal insanity, one of those cases which, without any severe symptoms, went on with a temperature of 102 or 101 for three or four weeks after delivery. He had seen her three weeks after delivery and examined her. There was certainly no pelvic tumour, but distinct evidence of pelvic cellulitis. He expressed the opinion that her mental condition was more likely to give trouble than her pelvic condition. Within a fortnight of that time she was in an asylum. He thought such cases were very properly recorded and classified as puerperal insanity.

Dr. Bower said that sufficient stress was often not laid on the influence of heredity. Nearly all the puerperal cases that came into his asylum now were melancholic, but that was because he was too far away to have maniacal cases sent to him. He believed that recovery took place in a much shorter time than had been stated. The difference between the two classes of cases, viz., those in public asylums and those in asylums for the upper classes and in private practice was clearly shown. In public asylums one met with patients drawn from the poorer classes, who had not been treated at home, but in private asylums and hospitals for the insane; the cases had usually been treated by general practitioners until they could not be managed at home any longer. Such cases were, of course, much more protracted, although not so severe. He agreed with the author that change was of the greatest importance when the cases began to drag.

Dr. Savage, in reply, said that in talking of puerperal insanity they should remember what Dr. Sankey had said many years ago, viz., that a certain number of women break down at the puerperal period, either because they were anæmic or from sepsis. There were certain other people who would become insane under any circumstances, and who broke down under the strain of parturition. The point about which most difference of opinion had been expressed that evening was as to whether there was such a thing as puerperal insanity. He pointed out that there was a period, the puerperal period, during which insanity occurred, which often presented features in common. There were many

other contributing conditions besides sepsis. If all the cases were septic he thought they would have come nearer a definite conception of the disorder than they had ever been, but he did not think this was so. If anything were characteristic of the onset of puerperal insanity it was the sleeplessness. This was of the greatest importance. If a puerperal woman had slept well they might be sure that insanity was not coming. It was the persistent sleeplessness—for there was sleeplessness and sleeplessness—there was a placid almost restful sleeplessness, and there was an active miserable sleeplessness, an agonising sleeplessness, which the parturient woman complained of and spoke of as something too horrible to describe. He said that one out of fourteen women admitted to Bethlem was suffering from puerperal insanity, but the proportion varied considerably. It seemed that there was not so much insanity associated with illegitimacy as was believed. Chloral was sometimes very useful, but he had a great dislike to seeing patients persistently drugged with chloral and bromide. He thought a useful combination was that of the hypophosphites with bromide and quinine. Most statistics showed that recovery took place nearer five months after labour than three.

January 27th, 1896.

SOME DIFFICULTIES OF DIAGNOSIS IN HEPATIC DISEASE.

By T. Lauder Brunton, M.D., F.R.S.

Mr. President and Gentlemen,—In considering the subject of Difficulties of Diagnosis in Hepatic Disease, it seemed to me that it was of little use to attempt to give general principles, and that the best way in which I could utilise the 20 minutes at my disposal would be to take 10 illustrative cases :—

Case 1. *Malignant Disease—Liver apparently Normal.*—The first case which I should like to mention is one that was sent to me by Dr. Stevenson, of Grimsby. It illustrates the exceeding difficulty of arriving at an exact diagnosis in some cases of hepatic disease. The man, aged about 45, had been suffering from intense jaundice for two or three months before he came up to London. He was gradually losing strength, and was very anxious that something should be done to relieve him. On examination, a large tumour was found extending underneath the ribs on the right side, and clearly an enlarged gall-bladder. My colleague, Mr. Tom Smith, of St. Bartholomew's, opened the gall-bladder and attached it to the abdominal wall. The gall-bladder was found very greatly distended with bile, but no calculi were

present. Three days afterwards the man died of collapse. It would, no doubt, have been put down as a case of death from the secondary effect of chloroform by some writers, who attribute cases of collapse occurring in this way to fatty degeneration of the heart from the action of the chloroform. Fatty degeneration of the heart was found, but in this instance ether was the anæsthetic employed. On *post-mortem* examination, the liver was found to be perfectly healthy. To all appearances it was of the normal size, and in passing the hand over it nothing wrong could be found with its texture, excepting that in one point, about the middle of the common gall-duct, a small nodule was felt about the size of an ordinary French bean. A probe pushed into the duct from the duodenum was stopped by this nodule. A probe put into the duct from the gall-bladder was also stopped. It was impossible, however, even with the liver lying in the palm of one's hand, and feeling the nodule with the fingers of the other hand, to determine the nature of the nodule. It was only upon section that the nodule was found not to be a gall-stone, but to be the tail end of a piece of malignant disease about the size and shape of a Jargonel pear. This case I think clearly shows the impossibility in some instances of arriving at an exact diagnosis.

Case 2. *Malignant Disease simulating Cirrhosis.*—The second case was that of a man, aged about 45, who had suffered for five years from indigestion. He had been very much worse for a year before I saw him. The dulness of the liver was three inches in the nipple line, its edge was somewhat hard. The diagnosis was cirrhosis. Shortly after I began to see him, the liver swelled somewhat, and I thought this was an attack of congestion occurring in a cirrhosed liver, but, instead of passing away, the swelling gradually increased, and in about three months the gentleman died of malignant disease of the liver, that organ becoming so large as almost to fill the abdominal cavity. One point that might have led us to a correct diagnosis was the constant persistence of disagreeable flatus, strongly smelling of sulphuretted hydrogen, and also another point, which was insisted upon by our President, who had kindly sent the patient to me, viz., that this gentleman, although a free liver, had never been accustomed to take spirits, but had always stuck to wine, and that of the best quality. The points here then that might have led to the correct diagnosis were the persistent flatulence of a disagree-

able odour, and a history of the kind of stimulant that the patient was accustomed to take.

Case 3. *Probable Syphilitic Disease simulating Cancer.*—The next case is that of a man, aged about 45, who came to me with a liver reaching down below the umbilicus. There was no cardiac disease to lead to enlargement from passive congestion, and the diagnosis seemed to lie here, between either a syphilitic liver or a case of malignant enlargement. Iodide of potassium in large doses very quickly reduced the swelling, and in about four or five months the liver had returned nearly to its normal size. In this case the absence of jaundice and emaciation pointed to specific rather than malignant enlargement, but the diagnosis was first rendered certain by the effects of treatment.

Case 4. *Enlarged Liver—not Malignant.*—A similar condition occurred in a man, aged 63, who was suffering from glycosuria. He had an enormously large liver, which under iodide went down, taking, however, as it decreased in size, a nodulated form, and ultimately it took a form very strongly suggestive of malignant disease, with a sharp nodule presenting downwards in the middle line. So much was this the case, that every time I saw him I said to myself: "If I saw this patient for the first time I should say he had malignant disease of his liver." But the progress of the case showed that it could not have been one of malignant disease, because the patient lived for a good many years, and ultimately died of abcesses in the leg, leading to septicæmia.

Case 5. *Enlarged Right Hepatic Lobe—Elongated Gall-bladder.*—The next case is that of a lady with a somewhat elongated thorax, and with a tumour, apparently connected with the liver, coming down nearly into the pelvis. The left side of this tumour was soft and elastic, the right side was hard and resistant. This was supposed to be a distended gall-bladder, the distension being probably due to obstruction of the gall-duct. The lady at the time was suffering from jaundice, and it was uncertain whether the gall-duct was stopped by calculus or by malignant disease. It turned out, however, to be a case of malignant disease. The *post-mortem* examination, of which Mr. Hartley kindly sent me the notes, showed that what we had taken to be an enormous gall-bladder was not really such a large gall-bladder as we supposed it, but was due to the curious shape of the liver. The right lobe of the liver was very greatly elongated,

possibly in consequence of tight lacing, so that the hard resistant part, which we took to be probably a stone in the gall-bladder, was really the elongated right lobe of the liver.

Case 6. *Malignant Disease simulating Aneurism.*—The next case, a patient of Dr. Harper, of Barnstaple, was a man, aged about 60, who had been failing in strength for eight or nine months. He had failed rapidly for two or three months before I saw him, and, several months before he consulted me, had an attack in Naples of what was presumed to be malarial fever, with severe rigors. When I saw him, he had a large rounded swelling in the epigastrium. This seemed, on pressure, to descend with the respiration, but the upper part of it was very pulsatile; so strong was the pulsation, indeed, that it really seemed to be a case of aneurism. Because the swelling descended with the respiration, I was inclined to suppose that it was a case of disease of the liver, possibly gummatous, or possibly cystic. The patient was seen by another consulting physician, who found a murmur distinctly over the liver, and gave it as his opinion that it was a case of aneurism. Curious nervous symptoms set in, and the patient shortly died. At the *post-mortem* we found that this really was a case of malignant disease of the left lobe of the liver, the right lobe being almost entirely free. On section, the left lobe of the liver looked almost like a section of brain, but the right lobe was almost entirely healthy, there being only a very few white nodules scattered here and there throughout the substance of the organ.

Case 7. *Gall-bladder simulating Floating Kidney.*—The next case is that of a lady, a patient of Dr. Jeaffreson, who had had a gall-stone about a year before I saw her. She was at that time complaining of *malaise* and a little sickness. There was no very definite jaundice, however, and I found on examination a somewhat rounded swelling below the ribs. This was resonant on percussion. I found it somewhat difficult to move, but I could by gentle pressure force it up behind the ribs, very nearly in the way that one can usually press up a floating kidney. I gave it as my opinion that it was a floating kidney, and I advised the use of a bandage and a pad. These, however, gave little relief to the patient, and Mr. Knowsley Thornton afterwards examined the case. He himself will probably mention what his diagnosis was, but, at any rate, he advised an operation, and upon the

operation being performed, a gall-bladder was found, with a number of stones. The operation proved completely successful in curing the patient. There was one point in this case which might be useful in the diagnosis of others like it. A floating kidney usually slips about on the slightest touch, but the tumour here required pressure to move it.

Case 8. *Gall-bladder simulating Floating Kidney.*—The next case that I have to mention I shall have to take at somewhat greater length. It is one in which I think the circumstances were such as to mislead one more than in most of the others. A lady, married, aged 32, was seen in June, 1887, by myself and Mr. Willett. She complained of pain in the right iliac region of some two or three years' duration. Nothing could be felt or discovered on examination. The urine was acid and contained crystals of nitrate of urea, with a faint cloud of albumen, and once crystals of oxalate of lime were discovered in it. The pain, which came on in paroxysms, and passed down towards the umbilicus, was supposed to be renal in origin. There had never been any jaundice. The patient returned to Java, where she had lived for many years, and remained there for five years. During this time she had several attacks of most severe pain in the right side, and on three occasions had what must have been attacks of peritonitis. In June, 1893, she returned to London with a lump below the liver, which had been noticed for two years, and had been diagnosed in Java as an enlarged gall-bladder. There still had been no jaundice. She was again seen in June, 1893, by Mr. Willett and myself, with the result that the swelling was taken to be a floating kidney. I am bound to say that this was chiefly my diagnosis, and that Mr. Willett was disposed to think that the swelling was a gall-bladder. The reasons that I had for believing that this was a floating kidney and not a gall-bladder were these:—That when the patient was lying, there was a tumour extending down from the ribs, upon the right side, to the umbilicus; when the lady stood up, this tumour descended still further, so that the upper margin of the tumour came to be nearly on a level with the umbilicus, while the lower end of it descended nearly to Poupart's ligament. On laying her upon her back, the tumour could be pushed up right under the ribs on the right side. In order to clinch the diagnosis, as I supposed, I put my fingers upon the tumour and held it down

towards the pelvis. When the lady then expired, there seemed to be no dragging upon the tumour as I presumed there would have been from the ascent of the diaphragm during expiration, had it been a tumour of the gall-bladder, and I, therefore, came to the conclusion that the tumour must be a floating kidney, and in this diagnosis Mr. Willett agreed. From this time onward the lady remained in England, suffering pain from time to time, but never severe enough to lay her up. In January, 1894, she became pregnant, and during the whole period of gestation suffered pain from the tumour. The child was born in September, 1894, and on December 10th, 1894, she was suddenly seized with severe pain in the side, and vomiting, and died of acute peritonitis. On December 2nd, during her last illness, the patient said her attack was similar to those she had in Java. The temperature rose to 107°; no food could be retained. During the attack the tumour was very tender. You will notice that in addition to the mobility of the tumour and its apparent disconnection with the liver, as shown by its not giving any sensation of being dragged upwards during expiration when held by the fingers, that there was the history of pain passing down towards the umbilicus. Now, Murchison says that in his experience, pain due to gall-stones is not reflected downwards towards the umbilicus, but only upwards. In this point he disagrees entirely with Trousseau, who states that the pain of a gall-stone may pass down towards the umbilicus instead of going up towards the trunk, as it usually does. On opening the abdomen, diffuse septic peritonitis was at once seen. The gall-bladder was greatly enlarged and distended, with nearly colourless viscid fluid and a large number of gall-stones. The largest gall-stone was nearly an inch in diameter, and was impacted at the neck of the gall-bladder. The gall-stones had set up inflammation in the gall-bladder, the wall at one place being no thicker than a piece of tissue paper. There was some suppuration into the gall-bladder at this place. No actual perforation was found, but it appeared that this suppuration of the gall-bladder was the starting point of the fatal peritonitis. There was no disease of the stomach, intestines, or pelvic viscera. There was no stone or any other disease of the kidneys or ureters. In this case my statements regarding the position of the tumour in the various positions of the patient, are from notes taken at the time, but I have no note of the position of the edge of the liver

and its relation to the tumour in these different postures, and probably I did not ascertain it, for at that time the idea that there might also be a loose attachment of the liver which would allow it to alter its place so much as to admit of such great alterations in the positions of the gall-bladder, never entered my mind. It is obvious that in any similar case this should not be omitted, and the lesson to be learned from the unfortunate issue seems to me to be that, where the pain is long continued, where it does not yield to remedies, and where the diagnosis is uncertain, it is better to operate, because the operation is likely to relieve the patient whether the disease be gall-stones or floating kidney.

Case 9. *Enormous Gall-stones without Hepatic Symptoms.*—The next case is that of a man who had no symptoms of gall-stone, no symptoms of disease of the liver at all. He one day appeared to get a chill by walking for a considerable distance very quickly, sitting in a cold tramcar afterwards, and then, when he got home, drinking copiously of milk. During the night he was seized with a severe attack of pain in the abdomen, and had all the symptoms of typhlitis. These symptoms continued at intervals for two or three months, and then finally he came to London. I may mention here that while he was in South Africa, a tumour had been found nearly at the umbilicus, extending 2 inches above and 2 inches below the umbilicus, but when he came to London this had disappeared and a tumour was then to be felt extending from the ribs, on the right side, nearly down to the umbilicus. This tumour could not be very readily moved, and was hard upon pressure. It was opened by Mr. Treves, who found that it consisted of a gall-bladder nearly half an inch thick, and with several enormous gall-stones, six, I think, of about the size of a walnut, and two about the size of a hickory nut. The operation was completely successful, and the man went back well.

Case 10. *Obliterated Gall-duct and Absent Gall-bladder.*—The last case that I have to mention is that of a man, aged 60, who had suffered from gall-stones more or less for six years. When he came to this country, he had lost weight very considerably, and he was not only much emaciated, but was of a very dark jaundiced colour indeed. The liver seemed to be slightly enlarged, but not very much, and there was a small rounded tumour under the ribs on the right side. This tumour I took to be an enlarged gall-bladder, and the case I supposed to be one

either of impacted gall-stones, or of occlusion of the gall-duct from old cicatrices. I thought that in all probability it was not of malignant origin, because he had been at one time, four or five months previous to my seeing him, very much worse, very much thinner, and very much weaker than he was. The fact that he had, as it were, begun to recover before I saw him, seemed to put malignant disease out of court. He was operated upon in Edinburgh, and it was then found that there was no gall-stone; there was, indeed, no gall-bladder. What I had taken to be the gall-bladder was the omentum and the pyloric end of the stomach tucked up into the liver in the place where the gall-bladder usually ought to have been. The gall-ducts themselves were completely occluded by the pressure of old cicatricial tissue. The adhesions were torn down, thus gaining a passage for the bile through the gall-duct into the duodenum, and the abdomen was sewn up. The gentleman recovered, but presented afterwards a very curious colour, resembling, indeed, that of a person suffering from Addison's disease; so that at first there was some doubt as to whether the supra-renal capsule on the right side might not have been injured by the operation. He was treated with minim doses of tincture of supra-renal capsules. Whether it was due to this treatment or not, I cannot say, but he gradually lost his strange colour, and one of the Christmas cards I had this year was his own portrait, to show how very much stouter he had got, and that he was perfectly well.

I fear I have exceeded my time, but I trust the cases I have referred to have been interesting and useful, especially those where a mistake has been made, and I hope the narration of them will enable others to avoid falling into similar errors.

ADDITIONAL CASES OF HEPATIC SURGERY.

By J. Knowsley Thornton, M.B., C.M.

The knowledge that Dr. Lauder Brunton was to read the paper which we have just heard has encouraged me to bring once more before this Society notes of some additional cases of hepatic surgery, operated upon since I last reported my work. The present communication brings my cases up to date, so that the 'Transactions' of the Society will contain a complete record of

every case of the kind I have ever treated surgically, with the exception of a few of my first cases, the note of each being longer or shorter, according to my estimate of the proportionate interest.

In my paper read on March 2nd, 1891, I said: "At the same time there is sufficient uncertainty and failure to show that it is to a more perfect diagnosis that our chief attention must be directed." I repeated this statement in April, 1892, and added: "Let me, then, urge both the physician and surgeon to note most carefully for themselves the actual symptoms, not trusting too much to the statements made by the patients, who are generally in too much suffering to be very accurate in their recollections." As I write, I do not know the exact scope of Mr. Brunton's paper, but I believe it supports the above views, and I hope that the brief notes of further cases which I now relate may, in some measure at any rate, be useful illustrations to his discourse.

Case 1 was that of a lady past middle life, seen in consultation with Dr. John Anderson early in 1893. She had first consulted him in 1891 for indigestion, flatulence, and constipation, which was relieved by ordinary remedies. Early in 1893 Dr. Anderson was called into the country to see the patient with her own medical man, when she was said to have congestion of the liver; he thought it was gall-stones, or possibly malignant disease, and advised her to come up and see me. We saw her together in February, 1893, and she then had a good deal of pain and tenderness over the gall-bladder, with a small swelling, which I was rather inclined to regard as malignant. She had not had any regular gall-stone colic, rather a constant localised pain, with much stomach and intestinal disturbance. She was thin, with a good deal of the peculiar set-pink colour, so often associated with malignant disease. We decided to see her again in a month, and then both thought the case was more like a distended gall-bladder, and it was decided that I should explore it. This I did on March 2nd, 1893, and found the gall-bladder slightly distended with glairy mucus, stained with bile, and the cystic duct full of and obstructed by a quantity of large sand or minute calculi. I cleared it out, but failed to pass a probe into the common duct, and was rather anxious as to the future of the case. I sutured the gall-bladder into the abdominal wound and drained it; very free discharge of bile followed, with great relief to the patient. But for some weeks we had no evidence of any passage from the gall-bladder into the

common duct; however, with patient probing with a fine gum-elastic probe and injections of olive oil to distension of the gall-bladder, we at last got it clear. The external wound then quickly healed. Dr. Anderson writes to me on January 7th, 1896: "Since the operation, Mrs. C. has certainly been in better health."

Case 2.—Mrs. C. M., age 49, was sent to me early in 1893, by Mr. Seton Pattison, with a history of attacks of gall-stone colic. She told me that she had always been a bilious subject, but for the last two years had suffered from attacks of severe abdominal pain, with pain under the right breast. At first these attacks were only occasional, then were more frequent, and latterly had recurred every two weeks. Each attack lasted from three days to a week, and nothing but morphia injections gave relief. On examination I had no doubt that the gall-bladder was distended, with calculi, and on March 9th I removed 70 stones, varying in size from a pea to a pin's head. I sutured the opening in the gall-bladder into the abdominal incision, and I also placed a glass tube in the peritoneum below the gall-bladder for the first few hours, as I thought a little bile-stained mucus had got into the peritoneum during the operation. This tube was only in 36 hours, and when I removed it, I put a small rubber tube into the gall-bladder; this was in for rather less than three weeks, and I then removed it and allowed the wound to heal, which it did quickly. Two years later the husband wrote in answer to an inquiry: "I think the operation has given every satisfaction all round."

Case 3 was one seen in consultation with Dr. Lauder Brunton and Dr. Jeaffreson, of Wandsworth, and it is a good illustration of the difficulties of diagnosis. I certainly never dreamed of the case being one of gall-stone, and I do not think this diagnosis had suggested itself to Dr. Brunton, if it had it was not mentioned in our prolonged and anxious discussion of the case. I believed it to be a malignant growth projecting from the surface of a movable right kidney, and advised exploration and extirpation, if the kidney proved to be as free as it seemed. This was agreed to, and on opening the abdomen I was greatly surprised and rejoiced to find a distended gall-bladder containing a single very large calculus. This was removed, the gall-bladder sutured into the abdominal incision, and drained, and in three weeks the wound had healed, and the patient made an excellent recovery, and 12 months later wrote me a very satisfactory report of herself.

The patient was a married lady, aged 47; she had suffered a great deal of pain in the epigastrium for about a year, each attack lasting about five or six weeks, and being more acute about an hour after food, and on getting warm in bed. The worst attack was about Christmas, and on January 3rd Dr. Lauder Brunton saw her with Dr. Jeaffreson, and advised a belt with renal pad, which did not relieve her at all, but rather increased the pain. I joined them in consultation a little later, with the result already recorded. Dr. Jeaffreson told me afterwards that he had always thought that the patient's pains were due to hepatic colic, and had searched many times for gall-stones but found none. He writes on January 12th that the patient is, and has been, quite well since the operation.

Case 4 was that of a married lady aged 60, whom I saw early in 1894, with Dr. Duncan, of Croydon, from whom I received the following history:—Good health up to July, 1891, when she had a severe attack of abdominal pain with rigors, vomiting, and fever, the temperature ranging from 101·0° to 104·0°, with a dry, brown tongue, and septic symptoms, and jaundice; this fever lasted for about three weeks, and the jaundice for two months. For some months a similar but mild attack, lasting a few days, came about once a month. Then she was well for a time, but towards the end of 1892 the attacks began again to be more frequent and rather more severe, with transient fever and jaundice. In June, 1893, after a rather more severe attack, the jaundice became persistent, and had continued up to my visit early in 1894. I found the patient much emaciated, of a dull greenish-grey colour, skin very irritable, urine dark mahogany colour, stools white, pulse quiet and of fair strength, temperature very irregular, it was 102·6° just after my first examination. It was clearly a case of stone impacted in the common duct, and we greatly feared, from the symptoms, that there was some deep-seated suppuration. It was decided that I should explore the abdomen. I operated on February 16th. The omentum, colon, and gall-bladder were all adherent, forming a dense mass, the gall-bladder being much contracted, and lying high up under the edge of a much enlarged and hard liver. I found a small angular stone in the hepatic duct, and this I crushed with forceps, guarded with indiarubber. I then found a larger stone in a dilatation of the common duct, and cut down upon it, and found it lying loose in an oval pouch, with

a minute opening with much thickened edges leading at each end into the duct. I removed the stone with some difficulty as it slipped about in the pouch. I closed the opening in the duct by two points of fine silk suture, but it was evident that the closure was not perfect, for before the operation was completed, bile-stained fluid began to flow from a glass tube placed in the peritoneum beside the duct. There had been so much inflammatory trouble round the duct that it was very difficult to examine it perfectly, but trying to trace it on to the duodenum I could not find any more calculi, and accordingly closed the incision round the glass tube.

The immediate result was satisfactory, the flow of bile from the tube was enormous and very offensive, the patient's general condition improved, nourishment was well taken. Strength was gained, and the urine became much more natural. The fever, however, continued much as before the operation, the temperature varying rapidly from almost normal to 103·0° or 104·0°, the pulse not at all corresponding, and rarely being over 90. On the eighth day, soon after the dressing, she had a severe rigor, and this was followed by a small dark motion, the first passed that had had any colour. From this time the temperatures became still more irregular, the pulse gradually rose in frequency and lost power, the appetite became capricious, and she died exhausted on the eighteenth day after operation. No *post-mortem* examination was obtained, but a slight examination of the wound showed that the general peritoneum was healthy. The wound in the duct was open. The exit opening from the pouch was so small, and the duct below so contracted, that it was necessary to slit it up with scissors in order to follow its course. There were several minute calculi in this portion of the duct, and one slipped into the duodenum in front of the examining finger. The duct was so much thickened that the calculi could not be felt in it on examination from the peritoneum. The liver and its vessels appeared quite healthy, when incised in various directions, and nothing was discovered to account for the high fever. I think that I made a mistake in this case in not opening up the lower opening from the pouch, and in not, at any rate, trying to pass a probe through into the duodenum. The small opening and the small calculi beyond it had undoubtedly interfered with the free downward passage of the bile, and prevented at the same time the healing of the wound in the duct. The rigors and fever recurring

at intervals during the whole period of persistent jaundice, and unrelieved by the free outlet for the bile, I can find no explanation for; and the reason for the very decidedly and peculiarly offensive smell of the bile, noticed as early as the second dressing, less than 24 hours after the operation, also remains unexplained. I noted this offensive smell from the discharged bile in a case recorded on November 21st, 1887, and it was also present in a slighter degree in the last gall-stone case given in the present paper —all cases with prolonged jaundice. The case emphasises the wisdom of early operation in all cases of impacted stone, and also shows that long-continued and severe jaundice, even when accompanied by fever and other septic symptoms, does not necessarily put the blood into such a condition that hæmorrhage of an uncontrollable character takes place. That such hæmorrhage is to be feared in some of these cases is undoubted, but in the cases upon which I have operated during long-continued and persistent jaundice, I have never met with it. The patient in this case was a strong woman for her age, and was hopeful and expectant of recovery to the last, so that everything was in favour of surgery, with the exception of these unexplained phenomena of persistent fever and offensive bile.

Case 5.—In March, 1895, I was consulted by a widow lady, kindly sent to me by Dr. Sansom, under whose care she had been for some time. She had lost her husband somewhat suddenly in 1892, and the shock had brought on the menopause, and she had not been well since. In July, 1892, she became gradually jaundiced without any pain, or loss of appetite, or loss of flesh. The jaundice gradually became very complete, and when I saw her it was as deep as I have often seen it. The stools were a light fawn colour, and the urine loaded with bile. She had begun to lose flesh and strength, and was much troubled with pain, distension, and flatulence after food, could take nothing but slops, and indeed had a great distaste for food of any kind. I was in great doubt as to the nature of the case, as there was no history to lead one to think that she had an impacted stone, and but little to make out by examination of the abdomen, except that she had a large, hard liver, with a sharply-defined edge, and a considerably distended but not very tender gall-bladder. I decided to explore, and opened the abdomen on March 22nd, 1895. I found a free and distended gall-bladder, and removed, by aspiration, 7 ounces of

thick, jelly-like fluid, with a dark, sandy deposit. Careful examination failed to reveal any calculus. I opened the gall-bladder, and scooped out a quantity of dark, inspissated bile almost solid, and cleared a quantity of the same out of the cystic duct, which it entirely blocked. I could not pass a probe down the common duct, but could make out no definite cause of obstruction except that the duct felt hard and whipcord-like. There were no adhesions or evidence of inflammatory trouble. I sutured the gall-bladder into the parietal wound and drained it. It was at once apparent that the hepatic and cystic ducts were clear, for there was an enormous discharge of bile, with great relief to the patient: the discharge frequently had a disagreeable odour, but was hardly offensive. This went on for weeks, the urine became natural, the skin cleared, appetite and digestion and strength improved, but the flow continued, and the stools were persistently clay-coloured; once or twice they were a little more coloured, but there was never any distinct evidence of any passage of bile through the common duct, constant probing and oil injections failing altogether, up to the time I left town for my autumn holiday, to effect a passage. I should have mentioned that in the early days after the operation there were, from time to time, a few small, dark gall-stones passed from the wound. She went into the country when I did, and I have not heard from her since.

Before she left I fitted her with a belt and cup receiver to collect the discharge, similar to those worn by renal cases, but it did not answer quite so well as in those cases, being very difficult to keep in position. In answer to an inquiry addressed to this patient since writing the above, I have heard from her that the biliary fistula is *in statu quo*, and that large quantities of bile sand have been discharged since I saw her in the autumn, and that there is still a certain amount of this daily, when the receiver is washed out. She says: "I am getting much stronger, but I cannot tell you how much I have suffered with indigestion." She naturally shrinks from further surgery, but I shall hope some day to put her right by opening the gall-bladder into the intestine.

These are the only cases of gall-stone that I have operated upon since I last reported my work to the Society, but there is one other case in which I fully expected to find them, but found, and cured instead, a condition which I have not met with before, and which I have not seen described by any one else.

The patient was a married lady, aged 56, seen in June, 1893, in consultation with Dr. Douglas Powell. Two years before we saw her she had, while staying in town, and when apparently in good health, a sudden attack of severe pain along the lower margin of the liver. The attack left as suddenly as it came on, at the end of four days. Later, at home, it returned suddenly. There were off and on pains for a week, and then a very severe seizure, requiring hypodermic injections for its relief. She was in bed eight weeks and very exhausted. There was never any distinct jaundice. After this, attacks of pain became frequent and severe, about every six weeks, so that she told us life was not worth living. There was pain over the collar-bones and in both breasts after the attacks. On examination, I found a large, hard, irregularly distended gall-bladder, and great tenderness all over the liver, along the course of the common duct, and over the duodenum.

Dr. Douglas Powell agreed with me that the case was probably gall-stones, and that an operation was desirable. I operated on June 12th, 1893, and found a much distended gall-bladder and a rounded dilatation of the cystic duct, which, on examination from the peritoneum, suggested a small stone covered with a much thickened duct wall; then, feeling it more carefully, I thought it might be a new growth, like the one in a case already recorded. On opening the gall-bladder I found that there was an hour-glass contraction of the lower end of the gall-bladder, with a very minute pin-hole opening into the lower pouch, and this pouch tensely distended was the body I had felt. So far as I could discover, there was nothing else wrong, and my treatment consisted in free dilatation of the contracted and thickened parts, until, with gentle pressure, I could push my thumb through. It was obvious that all was free below, because the contents of the gall-bladder, instead of escaping at the wound, disappeared downwards. I sutured the gall-bladder into the wound, and drained it as a precaution. She was quite well in three weeks, and I accidentally met her husband at a railway station a few weeks ago, and he told me that she had remained well ever since, merely having occasional little discomforts about the region of the gall-bladder in the first few months after the operation. Shall we ever be able correctly to diagnose a case like this without an exploratory incision?

Two other cases merely require mention to make my record complete. On May 28th, 1892, I opened and drained a large hepatic abscess for a gentleman who was under the care of Dr. Thin; he made a very good recovery. In February, 1893, I explored the liver of an old gentleman, and confirmed my own diagnosis of cancer. He recovered well from the exploration, and nothing else would have satisfied him, as he was sure that he was only suffering from gall-stones.

I append a table of all the cases brought before the Society in my various communications; it does not include some half dozen cases of hepatic surgery operated upon before I began to report this branch of my work to this Society :—

	Cases.	Deaths.
Cholecystotomy	15	1
Cholecystectomy—two cases of calculi, one of growth in the duct	3	0
Choledochotomy	5	1
Drainage of abscesses resulting from gall-stones..	2	0
Separation of adhesion round gall-bladder ..	2	0
Dilatation of hour-glass contraction of gall-bladder	1	0
Drainage of hepatic abscesses	2	0
Hydatids of gall-bladder	1	0
Hydatids of liver	2	0
Exploratory operations—four malignant disease, two syphilis, two nothing discovered	8	1

A total of 41 cases, with three deaths, a mortality of only a little over 7 per cent., which may, I think, be considered very satisfactory, in view of the formidable nature of most of the operations. This mortality is higher than that of my operations for uterine tumours, and still more than twice as high as the mortality of my recent ovariotomies, whereas the series of cases of renal surgery which I have just brought to a close in the 'Lancet' has a mortality of 14½ per cent.; and performing during the last 25 years a good many amputations of the mamma each year, for many years past, with clearance of the axilla in every case, I have not had a single fatal case.

Comparative statistics of this kind from the practice of a single operator must, I think, be of some value, and though they are outside our special subjects of consideration to-night, I venture to place them briefly before the Society, in the hope that they may be useful as indicating the lines on which we must work to improve the results in the groups of cases which are seen to have the highest

mortality. Nothing will do more to help in this direction than the perfecting of diagnosis. The more perfect the diagnosis before operation the better will be the plan sketched in the mind of the careful and thoughtful surgeon, and the less chance will there be of any little error or omission in those minute details the perfect carrying out of which is the essence of good and successful surgery. However brilliant and resourceful the surgeon may be, his work is, I am convinced, always at its best when he has been able carefully to think over the possible and probable difficulties to be encountered and overcome, and this can only be done if there is a reasonably clear diagnosis to work upon.

The PRESIDENT observed that abdominal surgery in the hands of Mr. Knowsley Thornton was becoming so safe that it was really becoming almost a routine aid to diagnosis. His paper indicated the striking advance which had taken place in this department of surgery with which his name was so intimately associated. Dr. Lauder Brunton's paper illustrated in an admirable manner the difficulties which physicians had to encounter in the diagnosis of this class of cases.

Mr. TREVES observed that the papers could not fail to do much to remove the difficulty which everyone felt in dealing with this branch of abdominal surgery. With regard to the points raised by Dr. Lauder Brunton, he would draw attention to two or three common facts to be noticed in these difficult cases, viz., that a very large number of them were concerned with the diagnosis, real or supposed, of carcinoma. It was remarkable that a patient was seldom said to have carcinoma, where further examination showed this not to be the case, whereas the converse was extremely common. In many of these liver cases the three great features of malignancy—loss of flesh, colour, and strength—are not so pronounced as in cancer elsewhere. They are often present in non-malignant liver troubles. It was, he said, a fact that even when the liver was exposed to view, the diagnosis was not always forthcoming. He had performed an exploratory operation in the presence of two physicians, and they found nodules in the liver which they all concluded were cancerous, but the patient made a perfect recovery. He urged that it was time that the stereotyped account of gall-bladder troubles was re-written. First, the fundus of an enlarged gall-bladder was not always round, as described. It might be pointed like a horn. Then again, even without adhesions there might be bowel in front of it, giving a resonant note over the upper part of the tumour. Then again, the gall-bladder did not always travel along the text-book route when enlarging. Another point which surgeons would be able to assert was that pain in gall-bladder troubles did not necessarily extend upwards. Surgeons who saw many cases of complete biliary fistula were disposed to doubt the physiological powers accredited to the bile. Liver operations were becoming among the most common in abdominal surgery. During the early part of the present month he had published a paper in the 'Lancet' containing notes of 27 abdominal operations performed during the first six weeks of the winter session, and six of these were upon the liver. In respect of the hæmorrhage which was supposed to be so likely to occur in operations on the liver, he pointed out that he had

made incision into the liver substance to a depth of two inches or more, and the hæmorrhage which had taken place was not alarming, and was easily controlled by sequestration. The liver could be swung up if prolapsed, as he had recently done in a case of Glenard's disease. In hepatic operations disaster had followed creditable but obstinate attempts to evacuate gall-stones under all circumstances. A gall-stone in the common duct ought to be dealt with, but the patient's life might be sacrificed in persisting in attempts to remove a stone in the cystic duct. Many of the impacted stones would come away if left. In one of Dr. Lauder Brunton's cases there was one stone in the cystic duct that could not be got out without considerable violence. He left it, but in the course of time it became loose and was removed with great ease. In pursuit of gall-stones which were making their way towards the stomach or colon it was often desirable to merely make an opening down to them and leave them to work out. In one such case he believed the operation would have terminated fatally had he persisted in the attempt to remove the stone, which was finding its way into the stomach. It came away in four or five weeks of itself. Nothing seemed to suit these operations so well as that form of drainage introduced by Mickulicks, viz., iodoform gauze. Its use was followed by admirable results. It shut off the peitoneal cavity, and unless kept in too long it gave rise to no trouble.

Dr. Sansom said that sometimes, though rarely, a favourable result occurred after a long time in cases in which the diagnosis of cancer had been made. He recalled one such case in his own experience. That patient became progressively emaciated, and the diagnosis of cancer was made by many competent observers, but by careful feeding and treatment that patient recovered. He called attention to one point of diagnosis which he thought was worth considering. In a good many cases there was some difficulty in diagnosing between cirrhosis and malignant disease of the liver. In cases in which thickening was felt under the right costal margin and there was a suspicion of carcinoma, a simple and easily employed process might serve to clear up matters. In regard to the left lobe of the liver, normally, of course, the hepatic dulness (and in cases of uniformly enlarged liver this was also the case), the right border of the cardiac dulness, and the liver dulness, were coterminous. There was in some cases an area, very easily demonstrated, of resonance between the right border of cardiac dulness and the liver so marked as to be something striking. That meant shrinkage of the left lobe of the liver, and its demonstration was a valuable means of diagnosis as between enlargement of the liver, not cirrhotic, and enlargement of the liver that was cirrhotic.

Mr. Marmaduke Sheild referred to three cases illustrating some of the points that had been brought forward. Case 1. A man over 40 came in suffering from obstructive jaundice of doubtful origin. He opened the abdomen, and aspirated about a pint of thick bile from an enormously distended gall-bladder. With the finger he could easily feel carcinoma of the head of the pancreas. He stitched the gall-bladder to the abdominal incision, leaving in a glass tube through which the bile drained. The man improved immensely for a time, and lost his jaundice. There was one curious point, the wound oozed very persistently for a week, indeed he was afraid the patient would die of hæmorrhage. It however subsided by mopping the edges of the wound with turpentine, and giving full doses of chloride of calcium. Ultimately, of course, the man died of the growth. Case 2. A man between 30 and 40 came with slight jaundice and severe abdominal pains, possibly due to gall-stone. He

explored, and it proved to be a typical case of the kind just mentioned by Mr. Treves, viz., those in which it was impossible to make a diagnosis, even after opening the abdomen. The liver was enlarged, there was nothing beneath it, except dense inflammatory adhesions. These were torn through, and with the finger deep down the fundus of the gall-bladder could be felt, with two small lumps on the under surface of the liver. He thought it was a case of perihepatitis with gumma, and closed the wound. The patient did well, but a month ago he returned so much emaciated that it looked as if after all he was going to die of malignancy. Case. 3. The patient was a middle-aged man, a French cook, who was admitted with severe abdominal collapse, and with signs of perforation of the intestine, probably of the duodenum or the stomach. He opened the abdomen, and found free fluid in the peritoneal cavity, and after a little search he found, under the liver, a hydatid cyst. This was opened and sewn to the wall of the abdomen, and in the end he made a complete recovery, although there was another cyst posteriorly which suppurated and had to be opened through the thorax.

Mr. Turner related a case which had come under his notice many years ago, long before liver surgery was what it was at present. It bore very much on some remarks made by Mr. Knowsley Thornton about the interval of resonance between the liver dulness and the gall-bladder. As a rule, it was said, the gut was adherent. He remembered a case in which an enlarged gall-bladder took the shape of a banana, and on the abdomen being opened it was seen amongst a mass of intestines. There were no adhesions; the intestines were situated just underneath the lower border of the liver about the tumour. That was why no diagnosis had been made. The cystic duct was dilated, and stones were removed, though one was left in. The patient got out of bed during the night, and walked across the room, and this was followed by fatal internal hæmorrhage. *Post-mortem*, the hæmorrhage was found to proceed from a small unnamed vessel. This was, he said, the second case to his knowledge in which fatal hæmorrhage had occured from a vessel so small as not to have received any anatomical designation. The fact that there was very often resonance between the liver dulness and the dilated gall-bladder was, he believed, more common than was generally supposed to be the case.

Dr. Lauder Brunton said that he had a case very similar to the one related by Mr. Treves, but considerations of time prevented his relating it. It was the case of a patient seen by him with Dr. Blakeney, of Dorking. The liver was somewhat enlarged, the health had been failing for three years, and when he was first seen by the speaker he found this enlarged hard liver, irregular in form, which he diagnosed to be malignant. The strength gradually failed, and the patient died. *Post-mortem* the liver was taken out, and the speaker thought his diagnosis was proved to be quite correct, for the liver was studded with large greyish-yellow masses, varying in size from a turkey's egg to a marble. On cutting through these masses the knife cried as when cutting through cartilage, but Dr. Sheridan Delepine reported that these lumps were not carcinoma at all, but were simply dense fibrous masses, the origin of which he had not been enabled to make out. In all probability the lumps that Mr. Treves saw in the liver in his case were the same as in this one. In the second case he had mentioned of an enlarged liver which gradually shrank, and had the appearances of malignancy, he was inclined to think that the induration which remained was probably due to masses of the same sort.

Mr. Knowsley Thornton, in reply, said he must thank Mr. Treves for his suggestion as to leaving stones when difficult of removal. This, he admitted, had never occurred to him. He thought, however, that Mr. Treves spoke rather too gravely of needling and also of crushing. His own experience was that it was wise in some cases in which there was a stone fixed in the duct to introduce in various directions a fine sewing needle. That broke up the stone quite sufficiently, and if they were going to leave it, it was much more quickly disposed of. In fact he had known it to pass quietly down into the duodenum and give no further trouble. There was an objection to Mr. Treves's method, viz., that one left the patient for weeks and even months with an external fistula, a very disagreeable thing. He did not think that careful crushing or needling was rough or dangerous. He agreed that packing with gauze was one of the greatest advances made in abdominal surgery at the present time. It was wonderful what could be done by packing in these cases, not only in hepatic surgery, but in abdominal surgery generally. He quite agreed with the remarks as to the difficulty of distinguishing between cancerous and gummatous nodules, even after opening the peritoneum. So great was that difficulty that on one occasion having cut into some small soft nodules he felt convinced that they were carcinomatous, and that nothing could be done, but the fact that they were not malignant was proved by their entire subsidence under large doses of iodide of potassium.

February 3rd, 17th, and March 2nd.

LETTSOMIAN LECTURES: THE OBJECTS AND LIMITS OF OPERATIONS FOR CANCER.

By W. Watson Cheyne, M.B., F.R.S., F.R.C.S.

LECTURE I.

Mr. President and Gentlemen,—In the first place, allow me to thank you for the high honour you have done me in selecting me as your Lettsomian Lecturer on this occasion. While your selection has done me great honour and given me much pleasure, it has also caused me great anxiety, more especially in the choice of a subject which would be of sufficient interest to the Fellows of this Society. For it seems to me that the great value of lectures of this kind is that they afford an opportunity, not so much of presenting original work as of reviewing the present standpoint of medical science in some particular department, of criticising the advances that have been made, of seeing what of these advances are good and what are of doubtful value, and thus of furnishing a basis for further work.

One of the departments in which there has been much activity of late years is in the treatment of cancerous diseases. The last few years have seen marked alterations in the older methods of operating in these cases, and also the introduction of operations in regions and of an extent formerly not thought of. Opinions differ very much at the present time as to the utility of many of these surgical procedures, and it is a matter of much interest and importance to consider the results which have been obtained, and to come to some definite conclusions as to their value. And it is with a view of trying to estimate the value of the work done in this department that I have decided to discuss in these lectures the objects which we should aim at, and the limits to which we may go in operating for cancerous diseases.

By cancer I mean the carcinomata, the essential feature of which is continuous and excessive growth of epithelium. Once this growth has commenced, nothing that we know of has any power to stop it. It invades the surrounding tissues, it spreads along the lymphatic vessels, or is carried by these vessels to the nearest lymphatic glands, it passes from one lymphatic gland, or one chain of lymphatic glands, to another, till it ultimately reaches the main lymphatic trunks, through which it enters the blood stream, and is deposited in distant organs and parts of the body. Deposited in these distant organs, it again grows, and the same cycle of events follows, or would follow, were it not that the patient soon succumbs from general poisoning as the result of absorption of materials elaborated at the seat of the disease, from interference with the vital functions owing to the presence of the growth in important organs, from repeated hæmorrhages due to erosion of blood vessels, and so on. Once this overgrowth of epithelium has begun, it goes on inexorably, unless we can arrest it, to the one fatal end.

There has been much controversy as to the source of the epithelial cells of cancer: some asserting that they can only arise from pre-existing epithelium, while others hold that they may be developed from other cells, such as connective tissue cells or the lymphatic endothelium; even at the present time pathologists are not absolutely in unison on this point. This may at first sight seem a matter of merely scientific interest, and not of any special importance for the purpose of these lectures, and yet on its decision rests the view which one holds about the curability of cancer and about the whole principles of practice. For if the cancer cells

are derived from connective tissue cells or lymphatic endothelium, there seems no reason why the disease should not begin anywhere in the body; or, at any rate, why, having once begun, it should not recur in parts which have no relation to the primary growth or the lymphatic flow from it, and thus we could have no guide as to how much and what tissues should be removed at the time of an operation, and no certainty—even although all existing disease has been taken away—that it would not break out in connective tissues elsewhere. If, on the other hand, the cancer cells arise solely from epithelium, we know where they begin, we can trace their mode of spread, and we have a good indication as to what tissues and how much of the tissue ought to be removed if we wish to prevent recurrence. This is really the histological side of the question as to the local or constitutional origin of cancer.

Förster and Virchow are those who are chiefly responsible for the view of the origin of the cancer cells from connective tissue. According to Virchow's view, it is the cells in the stroma which are the really growing parts of the tumour, and the so-called epithelial cells are only a transformation of these, and do not increase or take further part in the pathological process. He was led to adopt this view partly because he did not realise that the alveoli communicated with each other and with the surface, that, in fact, cancer was a tubular and not an alveolar structure, for being alveolar, it was not at all clear how the epithelium could get there from the surface; he also took up this view in part because he thought he could trace all sorts of intermediate gradations between the small cells in the stroma and the fully-formed, large, epithelial cells. This view was naturally widely taken up by Virchow's followers, and it was extended to the normal growth of epithelium on the surface of the body, it being asserted that there also we had to do, not with a multiplication of epithelial cells, but with a continued new formation of cells from the connective tissue beneath.

These views were very ably contested, and, in the opinion of most, completely refuted, by the classical work of Thiersch on 'Epithelial Cancer,' and subsequently by Waldeyer, who extended his ideas to cancer generally. Thiersch demonstrated, in the first instance, that the alveoli communicated with each other, that, in fact, they were sections of tubes and not cavities, as had

been supposed by Virchow, and he further showed, in the case of the epitheliomata, that before the surface of the tumour was destroyed by ulceration, these tubes communicated with the superficial epithelium. He clearly demonstrated the direct growth downwards of the epithelial cells, and laid stress on the development of the epithelium in the embryo, and on the view elaborated by Remak and His, that epithelium could only be derived from the epi- or hypo-blastic layers and never from the meso-blast. I cannot here go into the arguments in support of these two views, and I need only say that those elaborated by Thiersch and Waldeyer have now been accepted by the great majority of authorities, viz., that cancer is essentially an overgrowth of epithelium.

One argument has been brought forward by the supporters of the connective tissue origin of cancer which may be mentioned, namely, the observation which has been occasionally made where epitheliomata commence in connection with ulcers. Sometimes, apparently, the tumour begins towards the middle of an ulcer, or, at any rate, away from the edge, at a part where it is assumed that epithelial cells are not present, and in these cases, therefore, it has been held that we have an instance of development from connective tissue. The force of this argument was, however, upset by Friedlænder, who showed that it was not uncommon to find epithelium on parts of ulcers away from the edge, the cells being present there either because the ulceration had not destroyed all the epithelial elements of the skin at that part, or because healing had partly occurred and then the scar had broken down again, leaving islands of epithelium; or again, because epithelial cells had been deposited on the surface of the granulations and grown there like Reverdin's grafts.

What it is which excites this overgrowth of epithelium and imparts to it its power of indefinite extension is a subject which has been much debated, and which is at the present time one of the main topics of discussion. When we remember that normal epithelium does not possess an indefinite power of multiplication, and that the growth of epithelium is very readily arrested by unfavourable circumstances, we can see how very powerful and remarkable this factor must be. For the epithelial cells have in some way or other acquired properties which enable them to grow like parasites, quite independently of the rest of the body and of the cause which started the growth.

One set of views ascribes the increased growth to a number of

factors, especially causes which keep up irritation in the part for a long time. Such are injury, long-continued irritation, long-standing inflammatory conditions such as mastitis in breast cancer, increased physiological action, the menopause and suckling in the case of the breast, heredity, mental states, &c., but taking all these together they do not account for more than 25 per cent. or 30 per cent. of all the cases, some 70 per cent. to 75 per cent. of cancer cases remaining in which no history of any of the foregoing agencies can be obtained. It is, therefore, clear that none of them are essential causes of the disease, they can only be looked on as accessory factors, the true agent which leads to this remarkable epithelial proliferation being evidently something different and still unknown.

It is not part of my programme to discuss the etiology of cancer further than may be necessary for the development of my subject, but I may very shortly refer to one or two of these accessory factors. The occurrence of carcinoma after a blow is occasionally alleged by patients with regard to cancer of the breast, but the frequency with which this history is given varies considerably according to different authors, and is in no case common. Thus Fischer only obtained it in 1·6 per cent., Schulthess in 3·8, Von Winiwarter and Oldekop in about 7 per cent., Löwenthal in 13·4 per cent., &c. Considering the great number of injuries which are sustained, and the minute proportion of cases in which cancer follows, injury is evidently a very minor factor, but it is possible that it may have some effect in starting the disease, for example, by leading to extravasation of blood and continued inflammation, thus weakening the tissues and predisposing them to the epithelial invasion. While few lay stress on the history of a single blow as a cause of cancer—a history, I suppose, most of us have met with—it is quite different with regard to repeated injuries, long-continued irritation, or long-continued inflammation. It is pointed out that cancer in the alimentary tract most commonly occurs where there is some narrowing or difficulty in the onward passage of the contents, such as at the commencement of the œsophagus, opposite the bifurcation of the trachea, at the lower end of the œsophagus, at the pylorus, at the ileo-cœcal valve, at the hepatic or splenic flexures of the colon, in the sigmoid region, in the rectum just above the prostate, &c., and it is assumed that as a result of frequent passage of contents the epithelium becomes irritated and begins to grow wildly. On the other hand, it may be asserted by

those who hold the parasitic view that it is just at these parts that the parasite would rest and might take root; or again, that the frequent injuries to which these parts are subjected irritates them and thus predisposes them to infection. The best examples of cancer connected with irritation are the cases, by no means rare, of chimney-sweeps' cancer, and paraffin and tar workers' cancer. The former has been worked out especially by Mr. Butlin, and the latter by Professor Volkmann, and there seems no reason to doubt that there is a distinct relation between the occupation and the disease, though the rarity with which the disease occurs in paraffin workers and chimney sweeps shows that the nature of the work, though it predisposes, is not, after all, a very potent cause.

Another very common example given is cancer of the lip as the result of smoking, but although most people who have cancer of the lip smoke, the proportion of cancer in smokers over non-smokers is probably not greater than the proportion of smoking and non-smoking males; besides, why does the upper lip practically always escape, although it is as much exposed as the lower? Clearly, some other factor must come into play. This is the more evident when the fact pointed out by Von Winiwarter is borne in mind, namely, that in countries where women smoke, they are not more liable to cancer of the lip than women in other countries; and again, cancer of the lip was common enough before America was discovered.

So impressed are some with the relationship between irritation and cancer, that they assert that a simple tumour may be transformed into a malignant tumour by repeated irritation, and this controversy has especially arisen with regard to intra-laryngeal operations. No satisfactory evidence, however, has been produced of such conversion, and it is not at all a probable occurrence in the way which is commonly believed. If, however, it should ultimately be proved that cancer is a parasitic disease, it would be quite intelligible that a breach of surface caused by repeated snaring or cauterising of a warty growth might open a point of entrance to the parasite into a part already predisposed.

If we study the clinical effects of irritation of epithelium, we find that the result does not resemble the luxurious growth seen in cancer, and that it stops as soon as the irritation ceases. Mere irritation does not permanently implant such a power of overgrowth on the epithelium as is the case in cancer. The most usual effect of continued irritation on the skin is seen in the formation

of a callosity, and a callosity is by no means a favourite seat of cancer. A quantity of epithelium is no doubt produced, but this is done slowly; it ceases at once on removal of the irritation. Even when an epithelioma does occur in a part subject to irritation, it is generally only after many years, and that an irritation should go on for years and then of itself suddenly lead to the production of a cancer at one part of the irritated surface, is not easily conceivable. It must be that some new factor has come into play and produced the result. In other words, irritation is not a primary cause of cancer, it can at most be a predisposing agent.

Long-standing inflammatory conditions are also looked upon as predisposing to cancer, and the best example of this is cancer of the extremities occurring in connection with old ulcers or scars, and undoubtedly a large proportion of cases of cancer of the extremities do arise under these circumstances.

Another instance of the influence of inflammatory conditions on the production of cancer on which most are agreed, is the relation of mastitis to cancer of the breast. The relative frequency of mastitis and cancer is variously given; thus Neuendorf puts it at 31 per cent., Schulthess, among patients who have had children, at 38 per cent., Winiwarter, also among patients who have had children, at 21 per cent., and Eichel at 23 per cent. Perhaps a fair average from all the reports is that about 20 per cent. of the cancer patients who have borne children, and much fewer of those who have not, have previously suffered from mastitis. These statistics are, however, of little value, because we do not know exactly the frequency of mastitis in child-bearing women (according to Winkel it is 6 per cent., a smaller proportion than that of mastitis to cancer), and, further, there are a good many cases recorded where the mastitis had affected one breast, but the cancer developed in the other, so that even the existence of mastitis in a cancerous patient, or rather in one about to become cancerous, did not lead to its development at that part. Here also, therefore, we can only have to do with a secondary and non-essential factor.

A second set of views deals more widely and scientifically with the question of the origin of cancer and with the source from which the epithelial cells derive their increased power of growth. One of these is Cohnheim's, according to which there are left during fœtal life remnants of imperfectly developed tissue which at a later period, sometimes no doubt as the result of injury, &c.,

take on renewed growth and form tumours. On this view, the great activity of the epithelium is not a newly acquired property, but is merely a re-awakening of the latent energy which was stored up in these cells during fœtal life. There are many objections to Cohnheim's theory, and while it explains congenital tumours and deep-seated epithelial growths, such as dermoid cysts, it is difficult to understand how it is that these little inclusions remain just where cancer develops.

Another view may, however, be taken, viz., that this energy is imparted to the cells in later life, either as the result of invasion by parasites, or of something analogous to the process of fertilisation.

It is not necessary for my purpose to enter into any discussion of the so-called cancer parasite. There are histological objections to it which cannot be lightly thrown aside, indeed there are many objections to the parasitic theory as a whole, which can only be overcome if we assume that we have to do with a very unusual form of parasite, and with one which acts in a very unusual manner. The ordinary bacteric parasites attack the connective tissues or blood, and always lead, when growing locally, to some form of inflammatory action. Inflammatory action certainly accompanies the spread of cancerous epithelium, but it is quite a secondary occurrence, and does not at all resemble the inflammations characteristic of bacterial diseases. In tubercle, no doubt, endothelial cells multiply, and large cells are formed, but although bacilli are growing in their interior, these cells do not acquire the power of indefinite spread which is characteristic of the cancer cells. I know of no bacterial disease in which only epithelium is attacked, or in which anything resembling the invasion of cancer cells is produced. Practically, the only example of parasitic invasion of epithelium definitely known is the coccidial disease of rabbits. Epithelium is here attacked, but with what result? There is no hypertrophy of the epithelial cells at all corresponding to cancer. A growth is formed in which there are papillary processes of connective tissue lined with epithelium, and there is also hypertrophy and multiplication of epithelial cells, but the essential feature is hypertrophy of connective tissue as the result of the irritation, followed by secondary growth of the epithelium, rather than a primary growth of epithelium pushing its way into the tissue. Further, if we look at the epithelial cells which are or have been inhabited by the coccidia, they present a far from healthy appearance; indeed, it is characteristic of cells inhabited

by parasites that, unless where the parasite is going to the wall, the cells show degenerative changes, and do not present the characters of active and unlimited growth shown by cancer cells. Whether the disease be due at its commencement to a parasite or not, I cannot associate the mode of spread of the epithelial cells with the continued presence of parasites in their interior. The conditions are different from the ordinary parasitic diseases, for there new cells are constantly being formed from fresh connective tissue cells, while in cancer the new cells are simply descendants of the one or more epithelial cells which originally acquired the power of rapid growth; and it is difficult to believe that these innumerable secondary epithelial cells have been inhabited by parasites and yet have retained this remarkable power of growth.

As opposed to the parasitic view it has been suggested, among others by Scleich, that the starting point of a tumour is an impregnation of a cell or cells similar to the impregnation of the ovum by the spermatozoon. As to the source of this impregnation, Scleich's idea appears to be that any cell subjected to marked mechanical, chemical, or other irritation may act like a sperm cell to the other cells in the neighbourhood, impregnating them and endowing them with exceptional powers of growth and thus leading to their multiplication in tumour form; and he further thinks that cells become liable to this fresh stimulus when their period of physiological activity is coming to an end, thus explaining the late appearance of cancer. To the manner in which Scleich works out this view, there are, I think, many objections, which I cannot go into here. But some such view, namely, that some external agency effects once and for all a change in the original epithelial cells, by means of which they become endowed with the power of indefinite growth, seems to me to meet the case better than any other. It is not necessary that it should be a process of fertilisation, or that the exciting agent should be the same for all tumours, and in the case of cancer it is possible, though hardly probable, that it may be a parasite; but if it be we could hardly suppose that the parasite went on growing or acting.

Attempts have been made to support the parasitic theory by the inoculation of portions of cancer on the lower animals, but although in a few instances it appears that a certain amount of growth has taken place, no true development of cancer has been

obtained, and this is a result which cannot be a matter of surprise; indeed, if a development of cancer had been obtained, it would have proved nothing in favour of the parasitic theory, for as these experiments are ordinarily performed, there is no true inoculation. Portions of cancerous tissues are introduced into the subcutaneous tissues, or more often into the peritoneal cavity, and the result is awaited but it must be remembered that if there is a parasite, or if cancer is an infective disease at all, it is an infection of epithelium, and therefore it is the epithelium which should be inoculated, and not the subcutaneous tissue or peritoneum. If growth did occur as the result of the introduction of cancerous material into the deeper tissues, it would not imply any infection of the new individual, but simply a continued growth of the original cancer cells which were introduced. It is in fact rather surprising that more positive results have not been obtained by subcutaneous or inter-peritoneal inoculation of cancer, especially from animals of the same species, but it is probable that the epithelial cells die or lose their virulence before the part introduced has become properly adherent, or before a sufficient supply of nutriment has been furnished to keep it alive and active. The failure of the inoculation from one species to another is not so surprising, as the epithelium may not find a proper soil, and my experience in skin grafting rather tends to confirm this; I have found it very difficult indeed to graft large wounds on man with epithelium from the lower animals.

The only experiments which promise any definite result are those of the kind carried on by Mr. d'Arcy Power, where the cancerous material is introduced into an epithelial cavity such as the vagina and retained in contact with the epithelium, and where an opportunity is thus afforded for infection of the vaginal epithelium. Experiments of this kind have so far failed, although unfortunately for the efficacy of the cancer bodies, Mr. Power has seen them more than once in the vaginal epithelium in the animals so treated, without, however, any development of cancer. If they are parasites, that observation would show that they could live in the vaginal epithelium of guinea-pigs, but yet could not produce cancer. Similar inoculations have been made into the mammary glands; also without result.

I need not follow up this matter, but before leaving this question I should like to refer to examples of inoculation in man which have a very important clinical bearing.

Not only in experimental, but also in accidental and auto-inoculation, we must distinguish between *infection* and *implantation*. By *infection*, I mean a new outbreak of cancer as the result of the infection of fresh epithelium from a previous cancerous growth; by *implantation*, the direct implantation of cancer cells from the original tumour and their development in a new place. It is very doubtful whether any of the cases which have occurred in man are examples of true infection. I know of no instance where, for example, a squamous epithelioma of the mouth or pharynx has been immediately followed by a colloid cancer of the stomach, or a cylindrical epithelioma of the intestinal tract; while cases are known where cancers have occurred in these parts secondary to cancer in the throat, but they have always been of the type of the original growth, and not of the type of the local epithelium. Thus Klebs found in three cases, according to Erbse, squamous epithelioma in the stomach after epithelioma of the mouth, and Israel had a similar case, where the secondary cancer occurred in the duodenum. A number of cases are on record where one part in constant contact with the cancerous part has developed a secondary cancer, one of the most frequent situations being in connection with the labia; but as in these cases the character of the epithelium is the same in the two places, we cannot say whether we have to do with infection or transplantation; however, the great rarity of the occurrence is against the former view. Kaufmann mentions a case of squamous epithelioma of the hand, followed by squamous epithelioma of the conjunctiva, in a patient who had epiphora and was constantly wiping his eye with his hand. Kraske found in one case a cylindrical epithelioma near the anus, at a part where the normal epithelium is squamous, secondary to cylindrical epithelioma higher up. Perhaps the most striking example is one narrated by Tross, where a woman had a glandular carcinoma of the uterus, and her husband developed a similar cancer on the penis. Had it been a case of infection it would have been a squamous epithelioma, the fact that it was not shows that we have here to do with implantation and not infection. This is also an interesting case as showing the inoculability of cancer from one individual to another, but it tells strongly against the parasitic origin of cancer, for there must have been even better facilities for the implantation of a parasitic than of the actual cancer cells, and yet we see that it was the latter and not the former which were transferred. I need not go into other cases,

but in all it is evident that we have to do with implantation, and not with infection, because the secondary cancers had epithelium of the character of that of the primary epithelium, and not of the normal epithelium of the part. That cases like these should occur is, of course, only what one would expect, for in the spread of cancer, implantation is constantly taking place from the primary tumour to the lymphatic glands and distant organs. The wonder is not that it does occur, but that it happens so seldom; and its rarity is a strong proof against the infectiveness of cancer, for in all these cases there is plenty of opportunity, in fact constant opportunity, for infection of epithelium, while the opportunities for transplantation on a free surface, namely, denudation of epithelium, possibility of rest, &c., are quite rare.

I may also mention two cases of my own which introduce the real point of practical importance in reference to this question of implantation. Some years ago I was removing a very extensive sarcoma of the lower jaw, floor of mouth, cheek, &c., and I found, after going on for some time, that it was advisable to perform tracheotomy and plug the trachea, and this I did during the course of the operation. Whether I used the knife with which I had been previously working or not, I did not observe at the time, and I could not afterwards ascertain, but when the patient recovered and everything had healed up, he came back with a sarcomatous nodule, deep in the scar of the tracheotomy wound, and though I removed it as freely as possible, it again recurred and ultimately killed him, the seat of the original operation remaining all the time quite free from disease.

Another equally disappointing result occurred to me some years ago in a case of epithelioma. I had removed the whole tongue for an extensive epithelioma, along with glands in the upper part of one anterior triangle. The mouth remained well, but the patient returned with rapid enlargement of the glands beneath the sterno-mastoid on both sides of the neck. As we all know, the very rapid enlargement of epitheliomatous glands means a cystic condition from degeneration of the rapidly growing cancer cells. In this instance I thought it worth while giving the patient another chance, and I did a most extensive operation on both sides of the neck, removing most of the structures of the neck. Unfortunately, on one side, while the mass was being taken away, the cyst burst, and the fluid, containing flakes of epithelium, poured into the wound. I washed and sponged it out as thoroughly as I

could, but although the other side healed perfectly, that on which this accident happened became brawny and thick all over, in fact, there was a diffuse epitheliomatous infiltration of the whole wound, and there can be no doubt that the groups of epithelial cells which escaped from the ruptured gland grew in the parts of the wound in which they were deposited. Several instances of this kind of infection have been noticed, cases, for example, where cancerous ascites have been punctured and cancer nodules have developed along the track of the canula, or again where the cheek has been split in order to gain access to cancer in the mouth, and where cancer nodules have afterwards developed in the stitch tracks in the cheek. There is also good reason for believing that other local recurrences, for example, after breast operations, may not unfrequently result from similar soiling of the wound. In the case of the breast, this would more especially apply to soiling as the result of cutting the breast away from the axillary glands and thus cutting across infected glands or lymphatic vessels. The great clinical importance of these facts is self-evident, and they show the necessity for removing cancerous tumours entire and not piecemeal, and for taking great care not to soil the wound with material from a cancerous growth.

Mode of spread.—At the very commencement of this lecture I referred to the mode in which cancer spreads, namely, chiefly along the lymphatic vessels, and this lymphatic spread occurs from a very early period of the disease. Indeed, I believe, that from the very earliest period the cancer cells are growing in lymph spaces, and that it is this which leads to the alveolar or tubular arrangement so characteristic of cancer, these alveoli not being newly formed cavities, but lymph spaces and vessels much dilated and altered by the growing epithelial cells in their interior. One interesting point in this connection is the varying malignancy of these growths. This may be due to various factors; for example, to the kind of epithelium involved, the larger cell forms, namely, the squamous cells, not being so readily carried along lymph channels as the smaller; the cylindrical form, which rapidly undergoes colloid degeneration, adhering more closely to the walls of the vessels, and perhaps not growing so readily, and so on. A good deal also depends on the situation of the tumour. For example, a tumour growing in muscle spreads much more rapidly than a tumour in the skin, and this is very readily seen by comparing the rapidity of growth of an epithelioma of the skin and an epithelioma

of the tongue. In the latter case the cancerous growth very soon penetrates into the muscle, and the constant movements of the muscle tend to force cancer cells rapidly along the lymph channels. Waldeyer, also, thinks that the varying malignancy has much to do with the normal activity of the epithelium first attacked, and this may explain the greater virulence of these growths in young persons. In part it may also be due to varying virulence in the supposititious fertilising agent of which I have already spoken. It is possible that the general state of the patient's health and the nutritive condition of the tissues may have an influence in favouring or retarding growth. Of these various points, however, the most important practical one is the situation of the tumour, especially the fact that where a tumour is situated in muscle it grows much more rapidly.

A question of great importance for our subject is that of the *local or constitutional origin* of cancer, and it will be already evident from the tenor of my remarks, that, so far as I am concerned, cancer is essentially a local disease. Formerly cancer was very generally regarded as a constitutional affection, and therefore cure by operation alone was looked on as hopeless, and medicaments of all kinds were poured into the unfortunate patients so as to expel the black bile, or whatever else was supposed to be the cause of the disease. Operation was looked upon simply as a means of prolonging life for a short time, of relieving the patient's mental anxiety, and of getting rid of certain local troubles, and not as a means of permanently freeing the patient from the disease. Indeed, the chief reasons formerly adduced in support of the constitutional origin were the rapid recurrence of the disease after operation and the increased rapidity of growth of these recurrences, and this was supposed to be due to the increased activity of the constitutional condition as a result of the local disturbance.

Of late, however, more especially since the microscope has revealed the character of the disease, the view of the local origin of cancer has been gaining ground, and surgeons for the most part now undertake these operations in the hope of curing the patient, and not merely of temporarily prolonging life. Recurrence in deeper tissues is no evidence in favour of the constitutional theory, for as epithelium only grows from epithelium, the fresh growth of a mass of epithelial cells in muscles, glands, connective tissues, &c., after an operation, cannot imply that we have to do

with a constitutional disease which has broken out again, but simply that all the epithelial invasion was not removed in the first instance. The fact that there are now many cases on record where patients have remained for a long time well after operation is also evidence in favour of the local origin of cancer. I shall presently refer to some statistics on this point, but I may here mention two remarkable examples showing the local nature of recurrences.

The most striking of these is a case of Gross's, of spindle-celled sarcoma of the breast (and the argument is the same here as for carcinoma), where after 22 operations, performed during the course of four years, and the removal of almost all the pectoral and intercostal muscles, the patient remained well and had no trace of recurrence nearly 11 years later; the only conclusion here being that at all previous operations portions of disease had been left behind, but that at length all had been rooted out. The other is a case narrated by Oldekop, where a cancer of the breast was removed in 1852 and a recurrence a few months later. Three years afterwards, the other breast was removed for cancer, and this was followed by rapid recurrence a month later and a fresh operation. The patient was well 23 years subsequently, having had no further trouble.

Is cancer curable? Theoretically, being a local disease and spreading in the way we have described, it should be quite curable in cases where it is possible to remove all the off-shoots from the primary nodule, and clinical evidence bears out this view. We know that if any visible portion of disease is left behind, recurrence takes place almost at once; and even when the disease left is invisible, recurrence takes place in the majority of cases within a year. The cases which recur later on are quite few in number, and after three years the chances of recurrence are so slight that most surgeons assume, following Volkmann, that a patient who shows no disease for three years after an operation may be looked on as cured, and they ascribe disease appearing locally at a later period to a fresh development and not to a residue of the old trouble. Cases, however, are sometimes met with in which late recurrence takes place in parts, such as in glands, where the cells must have remained dormant from the time of the previous operation. Not very long ago I assisted Sir Joseph Lister in operating on a case in which the breast had been removed for cancer about 15 years previously. At that time a few very small hard glands

were felt in the axilla, but were not touched. They remained in *statu quo* till a short time before the second operation, when they began to enlarge and were accordingly taken away. On examination they proved to be carcinomatous glands. While writing this paper I have seen a case in which the breast and axillary glands were removed nearly four years ago, and in which a small recurrence in the axilla has just been noticed, and Case 12, Table I, is apparently a similar example. In the list of pharynx cases to be dealt with in the following lectures, two will be found of Kocher's, where disease reappeared locally 10 and 12 years after the operation, but in these the question of a fresh development arises. Gross has gone very fully into this matter, and states that of all the recurrences after breast operations, at most 2·3 per cent. take place after three years; on the other hand, Konig gives a much larger proportion of late recurrences, placing it at about 15 per cent. in patients alive and well after three years. The facts also vary very much with the situation and kind of disease, and in the case of intestinal cancer late recurrences are by no means rare. Nevertheless, for all practical purposes, we may adopt the three-year limit, and may feel sure that when a patient, especially with breast or throat cancer, has passed that limit safely the great probability is that he will have no further trouble.

If we take cases of disease in parts where it is in the first instance superficial, and where there is plenty of room for cutting wide of it, we find a large number which remain free from recurrence for many years. I may instance, especially, epithelioma affecting the extremities. There the disease is superficial in the first instance, the epithelial cells are apparently not so readily, or, at any rate, not so early, carried along the lymphatic vessels, as in cases where muscles are affected, or where the cancer cells are smaller, as in the breast. The glands are readily accessible, and one can get well beyond the disease by amputation, and in amputating well above the part, the local disease is thoroughly and widely removed. Statistics of the results of cancer of the extremities are given by various authors and are very favourable. Thus, to mention only one, R. Volkmann, in his papers on this subject, in Volkmann's 'Klinische Vorträge,' gives the cures as 51 per cent., and the recurrences as 35 per cent.

Another very favourite seat of cancer is in the face, and there, also, we have probably all had cases where free removal of the

disease has apparently cured the patient. The least favourable of the face cancers is that of the lip, no doubt because the muscle is soon attacked, but, even here, the results strongly support the view of the curability of the disease. Thus Worner brings forward a large number of cases, 277 operations, which had occurred in Von Bruns's clinique, during a period of 41 years. Of these, 106, or 38·2 per cent., remained well for more than three years, and in 54, which also remained well, the three-year limit had not yet been reached. The recurrences were 36 per cent.; 21 of the patients had remained well for periods varying from 10 to 40 years. Maiweg gives the results at Bonn of 182 patients, and of these, 81 had remained free from recurrence for from 3 to 18 years, giving the percentage of cures at about 44 per cent.; in 49 of these cases, more than six years had elapsed; in addition to this number there were also 44 who were free from recurrence, but who had not yet reached the three-year limit. It is also an encouraging point with regard to these cases, that in several of those ultimately cured, one or more operations for recurrence had been carried out soon after the first operation. Thus, in the 81 cured cases in Maiweg's list, nine had had recurrences, one of them thrice, one twice, and the rest once. Taking the results of a large number of surgeons together, namely, Thiersch, Billroth, V. Bergmann, V. Winiwarter, Fischer, Koch, Partsch, and Bruns, the proportion of cases of cancer of the lip well three years after operation is 28·1 per cent.

Take, again, uterine cancer. Hoffmeier gives the cases of cancer of the portio vaginalis and cervix uteri, operated on in Schröder's clinique, and of these, 42 per cent. remained well after three years, and 41·3 per cent. after four years, the operation being, in most of them, high amputation of the cervix. In Martin's statistics of total extirpation of the uterus for all forms of cancer, 45·7 per cent. remained well after three years. Of these, 10 were cases of cancer of the body of the uterus, and recurrence only took place in one. In both of these reports, however, we probably have to do with carefully selected cases, and do not thus get a true view of the probabilities of cure.

I shall presently bring forward evidence as regards cancer of the breast, showing that with increased care in performing the primary operation, there is a diminished number of cases in which recurrence takes place, a fact strongly in support of the curability

of the disease. Whether this prolongation of life is to be considered as cure or not—and for my own part I do not see what other name to give it—certain it is that a marked prolongation of life, and not merely the addition of at least a few months, as was the case when the operation was performed on the old lines, is the result of wide and thorough removal of the disease in the first instance.

Let us pass on now to the subject proper of these lectures, namely, the *objects and limits of operation* in cases of this disease. The primary object of operation in cancer is, of course, the prolongation of the patient's life and the alleviation of his local trouble, and what I propose to assert in these lectures is that these results are in most cases best attained by aiming, wherever it is possible, at the *cure* of the disease. Up till quite recently, and even now, many surgeons approach operation in these cases impressed with the view that real cure is practically hopeless, and that, with few rare exceptions, the most that can be expected is prolongation of life for a variable length of time. They therefore oppose elaborate and extensive operations, which in themselves must involve considerable risk to life, and are content with fairly free removal of noticeable disease; in some cases, indeed, they do not even go so far. For example, in cases of mammary cancer, even where some enlarged glands are to be felt in the axilla, they comfort themselves with the idea that the glands may only be enlarged from irritation and not from cancerous deposit, and therefore leave them alone until their true cancerous nature is only too evident. Of course, if operations are performed in this manner, and with these views, it is no wonder that these surgeons are confirmed in their views, and go on operating on cancer with the sole object of prolonging life for a comparatively short time.

In discussing the curability of the disease, I have already mentioned evidence as regards cancer of the extremities, lips, and uterus, which shows that a real cure is obtainable in a very considerable proportion of cases, and in the following lectures I shall try to produce similar evidence as regards other parts. I therefore hold, and would strongly urge the view that the first question to be kept before us in investigating a case of cancer is whether there is any possibility of curing the disease or not. Such a point of view makes a very great difference in the operation, for it is not then sufficient to remove only the noticeable disease, but it is

necessary to take away, as far as possible, the parts in which disease may have become disseminated, although still unrecognisable, in other words, possibly infected lymphatic areas. Thus, if the skin is affected, a considerable portion around must be taken away, and this is the more necessary where the infection of the skin has come from beneath, as, for example, where cancers of the breast reach the surface, for the dissemination in the cutaneous lymphatic plexus is often, under these circumstances, very rapid and extensive, and this is probably due in part to the larger size of the deep cutaneous plexus, which will, in the latter case, be first involved. Again, where muscle is infected, the cancer cells are very rapidly and early driven along the lymphatic vessels of the muscle, and even though there may only be one visible nodule in the muscle, the whole or the greater part of it must be looked on as suspicious, and must be removed, if there is to be anything like certainty in attaining the object of the operation, namely, the patient's cure. Again, as regards the lymphatic glands, we know that from a very early period they become affected, and that, of course, without any visible enlargement in the first instance, and in addition to this infection of the glands without enlargement, plugs of cancer cells very often stick in the lymphatic vessels on their way to the glands. Hence it is necessary in all cases, at any rate in the breast, where the disease has lasted any time, or extended at all deeply, not only to remove the primary mass freely, but also to take away the whole lymphatic area up to and including the nearest lymphatic glands. Thus, the operation performed with the object of curing the disease becomes a much more extensive one, and consequently much more serious than that which simply aims at getting rid of the main trouble for a time, and prolonging the patient's life.

The first question to be considered then, with regard to a case of cancer, is the anatomical one, namely, whether it is anatomically possible to remove all the local disease and the probably infected lymphatic area so thoroughly as to give a fair chance of non-recurrence. If this is anatomically possible, the next questions are what are the chances of death as the result of the operation, and what will be the subsequent functional result? In considering these questions we must remember that we are dealing with an otherwise incurable disease, one which is comparatively rapidly fatal, and one which in certain regions, for example the

throat, is often the cause of very extreme suffering before death supervenes, and, therefore, even although the risks are very great, unless the result of the operation is very fatal, the question of operation ought to be presented to the patient if there is a reasonable chance of removing the disease. There is, at the present time, a tendency with some surgeons to careful selection of cancer cases for operation, that is to say, only to operate on quite simple cases. This is not, I think, a proper point of view. No doubt it is the way to get good statistics, but what of the poor patients who are not operated on because the prospect of success is not good? I do not think that patients should be refused operation unless the disease cannot be removed, unless early recurrence is very highly probable, or unless operation means almost certain death, or yields a hopeless functional result. Of course, if one has something better to substitute for the radical operation, such as colotomy in extensive rectal cancer, the matter is quite different, but where this is not the case, the patient should be told all the circumstances, and allowed to take his choice.

The position which one ought to take up as adviser of the patient is, I admit, in some of these cases, a very difficult one. The following are the lines which I myself go upon. If there is no especial danger in the operation, and the chances of cure are good, as in the case of an ordinary breast cancer, then I should urge the operation, and should not enter into any such details with regard to it or the disease as might frighten the patient. Where the operation is more severe and the probable result is not so good, as, for example, in a breast case with marked adhesion to the muscle, I do not urge the operation, but I tell the patient that I think it is still worth while taking the chance, and I also point out that there is likely to be a good deal of inconvenience after the operation in the way of interference with the movement of the arm; such a patient will usually decide to have the operation done. Where the immediate danger of the operation is very great, as in the throat cases, which I shall mention in the next lecture, but where it still seems anatomically possible to take away the whole disease, the decision must, I think, be left entirely to the patient. The dangers of the operation and the risks of recurrence must be fully pointed out, as well as the subsequent functional results, and the patient must be left to decide. The position which I have assumed in these cases is this,

that after emphasizing the dangers of the operation and laying the whole matter before the patient in its worst light, I have said that if he wishes to avail himself of the chance, I am willing to perform the operation. The majority of such patients, when they know the facts of the case, prefer to make the best they can of what period of life remains to them, while some, on the other hand, decide to have the operation performed, and a certain proportion of these, small, it is true, reap their reward in marked prolongation of life, or even in permanent freedom from the disease.

The primary object of operation in these cases being therefore cure, the limits of the radical operation are where there is no reasonable prospect of removing the whole disease, or where, along with a very poor prospect of success, there is a very high mortality from the attempt. In such cases I do not think that operation should be mentioned at all, for even where the patient recovers from it, and has presumably two or three months added to his life, few would, I think, thank one for it, seeing that these two or three months have been spent in convalescing from a serious and, in the end, useless operation.

But even in cases where hope of cure or marked prolongation of life by a radical operation are out of the question, operation may sometimes be advisable with the object of removing symptoms which are immediately threatening to life, such operations, for example, as tracheotomy, colotomy, &c., or, in the second place, with the object of taking away the primary disease from a part, such as the mouth or throat, where its continued development means intense pain and trouble, and thus of substituting for these troubles an easier death from exhaustion. A *sine quâ non* of such operations must, however, be that they are reasonably free from immediate risk, and with regard to the second class, that there is a fair prospect of attaining the object of the operation, namely, the entire removal of the disease from the part operated on. I do not think that a dangerous operation is allowable for simple relief of symptoms, however proper it may be if a cure may be hoped for.

There are thus two different objects to be held in view, and two different questions as regards operation which we must bear in mind in treating a case of cancer, namely, (i) can we reasonably hope for a cure? for if we can, a serious or dangerous operation

is permissible; or (ii) cure not being possible, can we decidedly ameliorate the patient's condition by operation, such operation, however, not involving any great risk to life?

It is, of course, impossible for me, in the time at my disposal, to discuss the objects and limits of operation for cancer in all parts of the body, and I have therefore selected three regions for examination, namely, (1) the breast, (2) the throat, and (3) the intestinal tract, as these three regions illustrate very well all the points bearing on our subject.

(1) *Cancer of the Breast.*—The female breast is one of the most common seats of cancerous disease, and great attention has consequently been paid to cancer in this region, but it is only recently that any important advance has taken place. When I was attending classes on surgery 24 years ago, the teaching which I received, except from Sir Joseph Lister, as regards the method of operation, was simply to remove the breast in these cases by an elliptical incision including the nipple. After the operation the side of the chest was not flat; on the contrary, one could see a certain amount of fulness all round the scar, showing that not only were outlying lobules of the breast left behind, but, also, that merely the central portion had been removed. Further, the pectoral fascia was not taken away; indeed, it was held that on no account must it be touched, because otherwise the suppuration which was apt to follow might be extremely dangerous; and, lastly, only rarely, and with the greatest hesitation, were one or two glands excised from the axilla. As antiseptic surgery began to exercise its influence, and as it became evident that the extent of the operation did not increase the risk of septic disease, the tendency was towards more extensive operations, and in this, as in many other departments of surgery, Sir Joseph Lister took the lead, and began to extend the area of operation, especially in the way of more extensive, and finally of more or less complete removal of the axillary contents and of the pectoral fascia. It was not, however, till the researches of Heidenhain, and subsequently of Stiles and others in this country, that we knew exactly how the disease extended, or, indeed, how extensive the mammary gland itself was. As the result of these researches, we now know that by the older methods of operating, and indeed by any method which does not take proper cognisance of the

facts which these recent researches have brought to light, the patient never really has a chance of cure, properly speaking, and the wonder is not that recurrence so constantly takes place, but that in any cases (and this was the result in some) apparent cure follows.

Where a cancer returns after an operation, it, of course, means that the operation has not been sufficiently extensive to take away all the previously-existing disease, and it is only what one would expect that with imperfect removal the likelihood of recurrence should be very great. Of course, one cannot remove the internal metastatic deposits, and they may be, and often are, present at the time of the operation without having as yet given rise to any symptoms; but, on the other hand, the local return must be looked upon as the fault of the surgeon in not taking away enough of the tissue. No doubt in many cases this is a fault which is quite unavoidable, owing to the excessive and undiscoverable dissemination of the disease, but improvement in the results can only take place if we put the blame of the local recurrence on the operator, for just as we must assume at the present day that suppuration, or the occurrence of septic disease, after an operation through unbroken skin is entirely the fault of the surgeon, so it must be admitted, though not by any means to such an extreme extent, that a recurrence in the track of an operation wound, or in the neighbouring glands, also implies an imperfect operation.

Method of Operation.—Before going on to discuss the results of operation for cancer of the breast, I must very shortly indicate the sort of procedure which I think is necessary, and as I have already written on this subject, I need not go at all fully into details. Bearing in mind the very early period at which the cancer cells get into the lymphatic vessels, an operation to be at all complete must include the primary disease, the lymph channels leading from it, and the whole mass of the nearest lymphatic glands. It does not, however, follow that when these glands are enlarged it is absolutely necessary to go beyond the first group, because, for a time, at any rate, the disease seems to be held back at that point; but, as I say, the minimum operation for cancer of the breast, which will offer anything like a real chance of cure, must take away everything up to and including the first chain of glands. Hence, in the case of the breast, we must remove the primary disease, the whole breast, the tissue in which the lymphatics run from the

breast to the axilla, and the whole of the axillary glands. In this connection we must remember that recent researches have shown that the breast is a very much more extensive organ than was formerly supposed, and that by the old method of operating practically only the central part was taken away. Lobules of the breast run in the fat over the pectoral muscle nearly up to the clavicle, well into the axillary line, almost on to the sternum, and downwards on to the origin of the abdominal muscles. In the deeper part, also, the lobules of the breast are intimately connected with the pectoral fascia, and the removal of the breast without simultaneous thorough removal of the pectoral fascia inevitably means that numerous lobules are left behind. Hence our skin incisions must be very much more free than was formerly the rule, and, for my own part, I always take away the skin co-extensive with the prominent part of the organ. There is another reason for taking away this large amount of skin, namely, the existence of the suspensory ligaments of the breast, in which lymphatic vessels run from the organ to the skin, and these are not at all unfrequently infected with cancer cells. In addition to this portion absolutely taken away, the skin all around must be raised, leaving fat and lobules of the breast, as high as the clavicle, as far inwards as the middle of the sternum, downwards on to the abdominal muscles and outwards on to the latissimus dorsi, and one advantage of this free undermining of the skin is that in the great majority of cases one can subsequently bring the edges together by means of stitches. Where the tumour is situated towards one side of the breast, additional portions of skin must be taken away in a "V"-shaped manner, so that all the skin from the vicinity of the disease is removed. The skin flaps being held up, the pectoral muscle must be exposed at the upper part, and then, in order to ensure the removal of the fascia, a layer of the whole surface of the muscle must be taken away, and when the lower and outer edge of the pectoral muscle is reached, the fascia over the serratus magnus and the whole fatty tissue containing lymphatics, as far back as the edge of the latissimus dorsi, must be detached. In this way the primary disease, the breast, and the lymphatic vessels running in the fat and pectoral fascia towards the axilla are separated, and then one proceeds to clear out the whole contents of the axilla, finally leaving the nerves and vessels thoroughly cleaned as in an anatomical dissection.

One first follows the fat and fascia running between the pectoralis major and minor on to the costo-coracoid membrane, and then I expose the axillary vein at the lower part and tear open its sheath in its whole length. Then, raising the pectoralis minor, I begin at the very apex of the axilla, right up under the clavicle, and with a curved blunt instrument (the one I find most useful is a periosteum detacher, invented by Dr. Greville MacDonald for operations on the navel septum) and the finger detach the whole fat and included glands and lymphatic vessels, till everything except the important structures in the axilla has been got away. It is very important also that the whole tissue should be removed in one piece: in the first place, it is of great advantage in clearing the axilla to have the parts dragged down by the weight of the breast; and in the second place, it is very important not to cut through tissue which may be actually diseased, and which may lead to subsequent infection of the wound, as might be the case were the mamma taken away in the first instance and the axillary tissues removed subsequently. And this risk of soiling of the wound, as has been previously shown, is no imaginary one.

This operation is, in my opinion, the least extensive which ought to be done, even in a simple case, if the object is to cure the patient, but it must be modified and extended in most instances according to circumstances. Where the skin is much tacked down over the tumour, although it may not be actually involved in the disease, the cutaneous lymphatic vessels and those running in the suspensory ligaments are apt to be affected over a wide area, and hence it is necessary in such cases to cut exceptionally wide of the disease. Where the tumour itself actually involves the skin, however, we know that the disease has almost certainly spread widely in the cutaneous lymphatic plexus, and in such a case one must not hesitate to remove the skin extremely freely, and to leave a wound the edges of which it may not be possible to bring together. If such a wound is left it can very readily be closed by skin grafting, either at the time of the original operation, or, if the patient is too exhausted, about ten days or a fortnight afterwards.

Where the tumour is adherent to the pectoral fascia, as is very commonly the case, I think it is advisable to take away the whole thickness of the muscle at that part, and as the lymph tends to be forced onwards in the direction of the muscular fibres, the

mass of muscle removed should be detached along its whole length, from its origin to its insertion. In operating on such cases, as I approach the neighbourhood of the tumour, I usually sink my hand through the muscle, and then rapidly separate the part grasped from origin to insertion, and detach it at both ends; and, as a matter of fact, in many of my cases I have done this, and have thus removed a considerable part of the lower portion of the pectoral muscle. Halsted and others advise that the pectoral muscle—at any rate, its sternal origin—should be taken away in every case, partly in order to get thoroughly rid of the pectoral fascia, and partly in order to be able to clear out the axilla more effectually. As will be evident when I come to compare my statistics with Halsted's, this is really not necessary unless there are actual nodules in the substance of the muscle; more especially where the lower portion of the muscle is removed in the manner I have described, there is no difficulty whatever in pulling up the remains of the pectoral muscle sufficiently to obtain complete access to the upper part of the axilla.

Where the muscle itself is actually diseased, that is to say, where there are one or more nodules in the muscular substance, it has been pointed out by Heidenhain that the whole muscle must be looked on as infected, for the muscular contractions very quickly distribute the contents of the lymphatic vessels over it. He, therefore, advises complete removal of the pectoralis major under these circumstances. I am inclined to think, however, that even in these cases it is often sufficient to take away the sternal origin of the muscle, and that the clavicular portion may be left unless there is actual disease present in it. The connection between the two portions is not very intimate, and from a functional point of view it is of great importance to leave the clavicular part.

Where the glands in the axilla are markedly enlarged, the question arises as to how far one should go. In the first place, under such circumstances, it is certainly well to see what one is doing, and while, if the pectoral muscle is not affected at all, I prefer leaving it, I think it is well to divide it transversely, and after the operation stitch it up. The chief question, however, which has to be considered is whether, having found the higher axillary glands enlarged, one ought not to go further and remove the glands from the posterior triangle of the neck. Some have indeed tried to make it a universal rule that if the axillary glands

are at all enlarged, those in the posterior triangle must also be taken away; but, as I have already said, the first chain of glands opposes a barrier for a considerable time against the onward spread of the disease, and if only it is thoroughly removed, I think one may in most cases be content. Where the cancer is a slow growing one, and only the lower axillary glands are noticeably enlarged, I do not therefore open up the posterior triangle of the neck, and so far as I can recall, I have only twice had recurrence in the supra-clavicular glands. If, however, the highest axillary glands are noticeably affected, it stands to reason that the posterior triangle of the neck should be opened. Unfortunately, however, in these cases the line of infection does not so much run into the posterior triangle as along the subclavian vein into the thorax along a route that is only imperfectly accessible even when the posterior triangle is opened, and I have not seen much benefit in the way of finding and rooting out disease as the result of opening up that triangle. Mr. Arbuthnot Lane advocates division of the clavicle and clearing out the supra-clavicular glands in many cases, but this is a method which I cannot at all agree with, and I think that my results bear me out; and where the disease is noticeable in the supra-clavicular glands, I believe that cure is hopeless. Some have also advocated amputation at the shoulder joint with the view of removing the axillary disease still more thoroughly, and this was first done by Sir Joseph Lister, partly at my own instigation. I do not, however, believe that when the disease has gone so far as to necessitate such a procedure, there is the slightest probability of curing the patient. The conditions under which amputation of the arm would be necessary are the presence of a large mass in the axilla involving the nerves, for involvement of the vein or the artery, or even of both, does not necessitate amputation. I have on more than one occasion removed portions of the axillary vein to which glands were firmly adherent, and in one case I removed both vein and artery without any loss of vitality or other trouble in the limb; but where the disease is so diffuse as to involve the nerves, I think it may be taken as certain that it has extended beyond reach.

As regards the limits of operation for cure in breast cancer, therefore, I would exclude from operation (i) cases of cancer *en cuirasse;* (ii) cases where there is a large mass in the axilla involving the nerves; (iii) cases where large glands can be felt

above the clavicle; and (iv) all cases where secondary cancers already exist elsewhere. In none of these instances is there any reasonable prospect of cure; and there will be but little to be gained by subjecting the patient to the elaborate operations to which I have referred. Short of these conditions, however, I think a patient ought to have the chance of operation, and though, as I have said before, I would not urge it in bad cases, I think she should be allowed to choose. Even where the operation fails to cure, the prolongation of life is often marked, much more so after these thorough operations than after the ordinary imperfect procedure. In this list I have not included cancerous cachexia, as is usually done, because it seems to be due to absorption of products from the cancerous growth, and does not necessarily imply a general internal infection. I have repeatedly seen patients with marked cancerous cachexia improve immensely after the operation.

Results.—In considering the results of former and recent methods of operation for cancer of the breast, we may look either at the question of cure or at that of local recurrence, and the most satisfactory conclusion is, I think, obtained when we take both together; indeed, since the most recent views have influenced practice, the time is too short for the accumulation of any large statistics as regards cure, and one must therefore judge of the effect to some extent by considering the question of recurrence.

As regards cure, I have adopted Volkmann's three-year limit, and include under cures all cases which for a period of three years or longer after the operation have had no local recurrence, and have shown no sign of internal cancer. Although this three-year period is, as I have already said, not absolutely accurate, for a certain though small proportion of patients who have been alive and well at the end of three years have yet died of cancer, nevertheless, it is near enough for all practical purposes; and even if we only secured the patient three years of complete freedom from disease, such a gain would fully justify the most radical operation.

As regards the question of local recurrence, it will be seen that a very marked change has been produced by recent methods of operating. Formerly, and even now, local recurrence was extremely frequent (Gross puts it at 68·8 per cent., and that is not including the cases which have been lost sight of, probably many of which have also recurred). In considering this question of

local recurrence, it must also be remembered that up till recently half of these local recurrences took place during the first three months after the operation, and over 80 per cent. during the first year. Halsted has drawn a distinction between what he terms local recurrence and regional recurrence. By local recurrence he means recurrence actually in the track or area of the wound; by regional recurrence he implies recurrence in the neighbourhood, or in glandular areas which were not included in the first operation. Such a distinction is, however, extremely difficult to carry out, and it must often be impossible to determine whether a particular nodule has appeared in the track of the former operation or in its immediate vicinity. As a matter of fact, Halsted's regional recurrences imply an imperfect operation just as much as his local recurrences do; they simply mean that the operation has not been sufficiently extensive, no doubt in many cases because it was impossible. Hence, I prefer to group both these so-called local and regional recurrences together under the heading of external recurrences, and in my own statistics I speak of two sets of recurrences, namely, external recurrences in the wound, its vicinity, or the glands, and internal or metastatic deposits.

Cases of cure of cancer of the breast by operation were very rare in former times, and even at the present moment it is with many not so much a question of cure as one of prolongation of life: if cure happens to take place, it is a lucky and more or less unexpected result. The prolongation of life by the old operation is variously estimated at from 8 to 13 months, but this is really longer than it should be by reason of the fact that some of the patients have lived several years and have thus raised the average. Excluding cases which have passed beyond the three-year limit, I do not think that the prolongation of life by the old imperfect operation is on an average more than from six to eight months, though at the present time, where recurrence takes place after the more thorough operation, this prolongation seems to be considerably increased.

In looking back over old literature one is very much struck by the great rarity of cure, and the very desponding view which surgeons took of the chances of permanent freedom after operation. Velpeau only knew of 20 cases which had been cured, and it is by no means certain that all of these were cases of cancer. Many of the older surgeons state that they have not known a single

instance of cure. According to Henry, Benedikt of Breslau only operated eight times in 18 years, and during the last 17 years he did not operate on breast cancer at all; he considered, from his own experience and that of others, that the chance of cure was so extremely remote that he was not justified in subjecting the patients to the risks of the operation, which were at that time considerable. Von Winiwarter, in publishing in 1878 Billroth's results, viz., eight cures in 143 cases, says that this result is surprisingly good, and that no such favourable statistics had up to that time been published.

I need not recapitulate here the details with regard to various statistics, but I have in the second Table put together results which I have worked out from papers published from various cliniques; and in the first Table I publish all the cases on which I have myself operated since the beginning of 1890, at which time I obtained beds at the hospital and began to operate in this thorough manner. I would lay stress on the fact that my cases have been in no way selected, only cases of the kind previously referred to having been refused operation. Many of them were very advanced, and would have been refused operation by those who select their cases; and I may add, that in all of them I have found disease in the axillary glands. I may say, also, that all my cases were subjected to microscropical examination, so that there is no question as to the diagnosis in these instances.

With regard to the various statistics which have been published, there is one very curious fallacy which has cost me a great deal of time and trouble to rectify in preparing the second Table, and it is this—the total number of cases operated upon is given, and the cures have been calculated in reference to the total number, quite irrespective of the fact that in some the operations had been quite recently done. For example, taking the first line we have the total number of cases given as 147, and the cures as 8 per cent., but then a very considerable proportion of these cases had been operated on within three years of the publication of the statistics, and none of these could, by any possibility, have lived three years. It is necessary, therefore, in order to study the results of cure according to the three-year limit, to exclude all those cases in which the operation was done within three years of the publication of the report. Thus, in the first line we have to exclude no less than 61 cases, and when the number of cures

is reckoned in proportion to the remaining 86 cases, we have the percentage at once raised from 8 to 15 per cent. Some exclude the deaths and the cases lost sight of, but as regards the deaths I do not think that this is fair, more especially as in former times the deaths were excessive. Their exclusion would make it appear that an individual patient has a much better chance of cure than is really the case. As to the cases lost sight of, I do not think that they ought to be excluded, because it is highly probable—certainly from my own experience—that most of the cases of operations on cancer which are lost sight of either die or recur, and if they recur, knowing that the disease is cancer, the patients either decline to consider a second operation, or believe that a second operation is hopeless, and therefore do not show themselves again. It may be noted in the second Table that the percentages given by me do not correspond with those in the original papers, but that is mainly because the authors excluded the cases lost sight of, and thus got a better percentage result. I think that the second column, which takes into account all the cases which were operated on up to within three years before the publication of the report, represents fairly accurately the proportion of cures in the hands of these particular surgeons.

The study of the second Table fully justifies, I think, what I have said as to the necessity for extensive operation, and the advantages to be derived from it. Contrast the older results from Trendelenburg's, with 4 per cent. of cures, to Fischer's, with 15 per cent., or, taken altogether, an average of about 10 per cent., with the more recent results, varying from 15 per cent. in Küster's practice, up to 57 per cent. in my own, and we see that, as the result of greater care in operating, the chances of cure have been largely increased, and the recent results in this Table ought to be really better, for a little study of the methods employed by some of the surgeons in the more recent period, shows that even there the operations were not so complete as could be wished. The value of even an imperfect improvement is well shown in Esmarch's results, where, during the first period up to 1863, the old plan of operating was employed with only 4 per cent. of cures; while afterwards the axilla was cleared out more or less thoroughly, with a jump at once to 18 per cent., a result more than four times better.

Looking at my own results, it will be seen that the effect of

thorough removal of the disease is very marked indeed. Taking the cases which have been operated on in the manner described up to three years ago, 21 in number, we have no deaths, 12 or 57 per cent. of cures, and 9 or 42·7 per cent. of cases recurring either externally or internally. And if it be objected that 21 is a small number of cases to argue about, I would point out that 12 cures is more than can be shown by many of the older surgeons, although their cases exceed 100.

Again, if we study my results from the point of view of the return of the disease, taking in the recent cases, we have a total of 61 cases, with 20 or 32 per cent. of recurrences or metastatic deposits, and among those recurrent cases were two (Nos. 29 and 56) which were really inoperable (in one of them, indeed, visible disease being left behind), and which only raise the percentage of failures unnecessarily; and also included in these are two cases (Nos. 24 and 48) in which I only assume that there was a metastatic deposit, but have nothing but suspicion to go upon. Excluding the two cases (Nos. 29 and 56) as being inoperable cases, as is usually done in the statistical reports I have quoted, we would have 59 cases operated on with reasonable hope of cure, with 16 certain recurrences, or 27 per cent. Some of these, it is true, have only been operated on quite recently, and they therefore are not of much value, although it must be remembered that by the older methods local recurrences in half the cases took place within three months of the primary operation. At the same time, let us exclude the cases operated on during the last year (and, as I have previously mentioned, over 80 per cent. of the recurrences take place during the first year after operation), I say, excluding the cases operated on during the last year, we are left with 40 cases, with, at the very worst, 16, or 40 per cent. of internal or external recurrences (and that is including Nos. 24 and 29). Taking the external recurrences alone, we have in the 61 cases only 11 external recurrences (again including No. 29), giving an average percentage of external recurrences of 18 per cent. As regards the 12 "cured" cases, of course recurrence may still take place in some, but taking the most unfavourable statements, viz., König's, that 15 per cent. recur even after three years, we would still be left with nine cures (and that is leaving out also Case 9), which died well after three years), or 42 per cent. of definite cures —a result far superior, however it is worked out, to that obtained by the ordinary operation.

I have already referred to Halsted's paper (which up to the present has shown the most favourable results as regards recurrences), and he points out that in his 50 cases he has only had three local recurrences; but he has also had eight regional recurrences, and, as I have already said, I think it is much fairer to combine his local and regional recurrences under one heading, external recurrences, as I have done in my own statistics; and this gives him a percentage of 22 per cent. external recurrences. Contrast the results as regards external recurrence obtained by Halsted (22 per cent.) and myself (18 per cent.) with those of surgeons operating less completely, as worked out by Halsted. For example:- Billroth, 85 per cent.; Czerny, 62 per cent.; Fischer, 75 per cent.; Gussenbauer, 64 per cent.; Volkmann, 59 per cent., &c., and the difference between the old, imperfect operation and the thorough one becomes most striking and unmistakable.

While the results, as I have pointed out, are steadily improving, the proportion of cases which succumb to cancer is still considerable, and will not, I think, be much reduced till patients and doctors understand that there is a good chance of radical cure from early and thorough operation in mammary cancer, and that a suspicious lump in the breast, especially in elderly women, is not a thing to be watched; for I may say that over 90 per cent. of the swellings of the breast in elderly women are cancerous. Many of the deaths now are from internal metastatic deposits, and these are, of course, beyond the control of the surgeon, and can only be avoided by early operation. Indeed, it seems to me that in recent work metastatic deposits are apparently more frequent than formerly, but that is no doubt in part due to the fact that patients escape the local recurrences and live longer, and that thus the internal deposits have time to grow and attract attention.

Contrary to the usual dictum, it is now found that the most favourable of all cases for operation are those of atrophic scirrhus, and the more nearly a cancer approaches the atrophic form the greater is the chance of permanent cure; indeed, I believe that the malignancy of the cancer in the individual cases has a great deal to do with the result of operation, possibly more than the early period of the operation, but that, expressed in other terms, is only to say that in the less malignant forms of cancer, the disease does not diffuse itself so rapidly or widely, and that by

an extensive operation we have a better chance of getting beyond it. A patient who comes with a small tumour which has been noticed for several months, which has not markedly increased in size, and in connection with which we have only small glands in the axilla, has a much better chance than one who has found a tumour quite recently, which is noticeably enlarging and in which the axillary glands are of considerable size. In the former case the probability of getting beyond the disease is great, on account of its slow spread; in the latter the reverse is the case. Hence, while the sooner a cancer of the breast is radically removed the better, one cannot say that the chance of cure is necessarily proportionate to the early period of the operation; in any case, however, the chance of cure of necessity depends on the thoroughness of the operation.

I need not enter at length into the objections which are urged to these thorough operations. They are usually brought forward by those who only operate with the hope of adding a few months to the patient's life, and not of curing the disease. I may, however, refer to the one question of mortality. Formerly the mortality was great, and was much increased by opening the axilla, and this was due to sepsis. As that is avoided nowadays, we may safely conclude that when the argument of mortality is brought forward, the arguer does not keep his wounds aseptic. Halsted, in his 50 cases, has had no deaths; in my 61 cases I have had one death, with which probably the ether had as much to do as the operation; in fact, I think shock is practically the only risk which we have to face, and there is no question that the patients do suffer a considerable amount of shock in some cases; on this point I cannot agree with Halsted, who minimises the risk from this cause. In addition to shock, more than one writer has referred to pneumonia as occasionally occurring, possibly from long exposure in a cold room in the case of predisposed individuals, and I had this experience in one case where I performed an extensive operation for recurrence, the primary operation having been done by another surgeon. As regards the question of functional disability which is also sometimes brought forward, there is really comparatively little. At first, no doubt, the patient finds that the movement of the arm is very considerably impeded, but as time goes on this becomes more free, and ultimately, as a rule, the patient is able to do most things which

she wishes. After all, even if the arm were permanently useless, it would be a comparatively small price to pay for life.

I have previously mentioned several cases in which I do not consider that a radical operation is advisable, and the question in these is whether anything can be done in the way of prolonging the life of the patient, or of making the period of life that remains to her more comfortable. In some of these cases the patient's life can, no doubt, be prolonged by excision of the breast alone, or of the axillary glands as well, perhaps for three or four months, or even as long as a year, and she may then die of internal disease without suffering so much as she would have done from the local tumour. She should, however, be told that the object of the operation is merely to prolong life, and many women, knowing that, would prefer not to undergo it. In some cases where there is a foul ulcer, the patient may be relieved of much pain and trouble by removal of the breast. On the whole, however, I do not see any particular advantage in operating in cases of breast cancer unless with the view of curing the disease; and in cases where it is practically certain that the disease cannot be cured, the performance of an operation would depend entirely upon the patient's desire for a short prolongation of life or on the possibility of relieving her of some serious trouble. As a matter of fact, we do not have here, as we have in intestinal cases, any substitute plan to offer which will either relieve the patient materially or give any marked prolongation of life. It is practically either a thorough operation or nothing, and therefore the breast is not a situation in which the so-called careful selection of cases and exclusion of all but simple cases from operation is at all permissible.

LECTURE II.

In this and part of the next lecture I propose to consider the question of cancer as it affects the mouth and throat, more especially the pharynx. Here, as in the case of the breast, there is no real alternative operative procedure to that of removal with the view of cure. Œsophagotomy, gastrostomy, or tracheotomy, although they may prolong the patient's life for a very short time, do not add materially to his comfort and can in no way be looked on as alternatives to a radical operation, and in these cases therefore, as in the breast, I do not think that we can do very much in the way of selection of cases for operation.

As compared with cancer of the breast, the disease in the throat is in some ways more favourable for cure, in other ways less so. As regards the primary disease, the breast cancer is by far the most favourable of the two, for there it is fully exposed to view, and there is plenty of room for its free removal without endangering important structures. In the mouth and throat, on the other hand, the disease is close to, if not involving, many important parts, the space in which one has to work is very limited, one cannot get much margin of healthy tissue around, and the early spread of the cancer to muscle, especially in the case of the tongue, tends to distribute it over a considerable area. In the throat, also, the disease is much less favourable for operation, because the septic element comes into play, and thus, instead of having to do with an operation, as in the breast, where the mortality is practically nil, we have to face a very considerable risk of death from septic disease.

On the other hand, cancer in the mouth and throat is more favourable as regards the glandular deposits, for in the neck we have an extensive glandular area exposed to view which can be much more thoroughly dealt with than in the case of the breast. It is true that many surgeons look on the glandular trouble as a most serious part of the disease, but for reasons which will be afterwards stated, I do not agree with this view. In one other respect, also, cancer in the mouth and throat is more favourable than that in the breast, viz., that metastatic deposits, which so often disappoint us in the latter case, are quite infrequent in the former.

Cancer in the mouth and throat is most conveniently considered under three heads, viz.: (1) cancer of the tongue; (2) cancer of the pharynx, tonsil, soft palate, epiglottis, &c.; (3) cancer of the larynx.

1. Cancer of the Tongue.

So much has been written already on cancer of the tongue that I will not take up time in discussing it, more especially as I wish to go pretty fully into the question of cancer of the pharynx, a still more serious form of the disease, one about which less has been written, the operations for the relief of which are among the most formidable and difficult in surgery, and which has recently interested me very much. I may, however, be asked whether I adhere, in the case of the tongue, to the principles of treatment laid down with regard to the breast, more especially with regard to two points. Firstly, as cancer of the tongue very soon spreads into the muscular substance, must Heidenhain's law be followed, viz., the removal of the whole muscle; and, secondly, should the nearest lymphatic glands be taken away in every case? The answer is practically Yes to both questions.

If we want justification for thorough operations in the case of cancer of the tongue, it is to be found in the great frequency of recurrence after operation, varying from 61 per cent. in Kocher's statistics up to 89 per cent. in Winiwarter's. It is difficult to estimate the relative frequency of local and glandular recurrences, and they most usually occur together, but, on the whole, local recurrences seem to be quite as frequent as glandular recurrences alone.

The question of how much of the tongue should be removed, and more especially whether the geniohyoglossus should be followed quite down to the hyoid bone, depends very much on the situation of the disease. Cancer of the tongue, as it comes under the notice of the operating surgeon, presents itself under two chief forms, viz., either as a more or less superficial warty growth, especially along the sides of the tongue, or as a deep ulceration extending well into the substance of the organ. In the former case, the deeper muscles of the tongue are not yet affected, in the latter they are; and, corresponding to this, we find a difference in the results of operation. Taking one of the most recent statistics of tongue cancer, viz., Kocher's results as published by Willy Sachs (Langenbeck's 'Archiv,' vol. 45), we find that in 19 cases the cancer was more or less superficial, and that of these three were

cured by operation (taking the three-year limit), or 15 per cent., four had remained well for one year or more, two died, and of the remainder five, or 27 per cent., certainly recurred, and the ultimate result of the others is not known; while there were 27 cases where the cancer had penetrated into the deeper substance of the tongue, of which only two, or 7 per cent., were cured, four died, and the remainder either recurred or there is no note of them after operation—certainly 11, or 40 per cent., are known to have recurred. In the superficial form, the tongue is not saturated with the cancer cells to anything like the extent that occurs where the disease has extended deeply into the muscle, and accordingly we have the more favourable results just alluded to, and the operation need not be so severe. Thus, in the superficial and laterally placed tumours, removal of the half of the tongue is in all probability sufficient, and where the tumour does not extend deeply into the substance of the muscle, the muscular fibres need not be followed down to the hyoid bone; on the other hand, where we have to do with a cancer which has penetrated into the substance of the tongue, we must look on the whole of the tongue muscles, at any rate on that side, as infected, and whether we content ourselves with the removal of the affected half or not, we must follow the muscular fibres right down to their attachment to the hyoid bone.

A second point to be noted in connection with operation for cancer of the tongue is the distribution of the lymphatic vessels. Where the cancer affects the base of the tongue, we have to do with a large lymphatic plexus which is not unilateral, and under these circumstances we often find enlarged glands on both sides of the neck. This plexus runs into glands in the anterior triangle about the angle of the jaw, and the lymphatic vessels seem to be specially connected with or related to the posterior belly of the digastric muscle. On the other hand, many of the lymphatic vessels at the anterior part of the tongue and the floor of the mouth run towards the submaxillary region, and it is there, and subsequently about the cornu of the hyoid bone, that the first enlargement of lymphatic glands is usually evident.

Where the disease is superficial and affects the front part of the tongue, the glands are not so early affected, and it is not so necessary to remove the glandular area in the first instance, but I think it is always well to take away the submaxillary and sublingual glands on the affected side, along with the lymphatic glands

so closely associated with them, and therefore I always tie the lingual artery in the neck, and clear out these glands with the fat in the neighbourhood, even although no glands can be felt, and then clip out the tongue from the mouth. In this case, the wound in the neck does not communicate with the mouth, and remains aseptic and does not, therefore, add anything to the danger of the operation. Where, however, the cancer extends deeply into the substance of the tongue, and more especially where it is situated at the back part, some more severe procedure, such as Kocher's operation, with thorough removal of the glandular area and of the muscle down to the hyoid bone, becomes requisite.

Where the disease affects the back part of the tongue, and division of the jaw is necessary, we have to deal usually with much more extensive operations, and with regard to these operations I shall have something to say when we come to speak of cancer of the pharynx.

The mortality in the latter cases is naturally greater, but has been much reduced of late years in accordance with improved methods of treating the wounds. Kocher's results show this very markedly, for while prior to 1882 he had five deaths in 29 cases, or 17·2 per cent., between 1882 and 1888, when he improved his methods, he had one death in 28 cases, or a mortality of 3·5 per cent. So also Winiwarter, publishing in 1878, gives a mortality of 42 per cent., while Volkmann had only two deaths in 91 cases, or a mortality of 2·2 per cent.; Winiwarter's large mortality being essentially due to sepsis, septic pneumonia, &c. Taking mild and severe cases together, and the statistics of a large number of surgeons, the mortality may be estimated at from 15 per cent. to 20 per cent.

The great advantage of operations confined to the interior of the mouth, such as Whitehead's operation, is that the wound is limited in extent and does not extend into the tissues of the neck, and the chief objection which is urged to the complete operation of the removal of the lymphatic areas along with the tongue, is that suppuration is apt to extend along the planes of the cellular tissues of the neck. I must say, that although I have done a considerable number of operations, both on the tongue and pharynx, on these principles, I have not had this occurrence, and that I attribute partly to the careful preliminary preparation of the mouth, teeth, &c., to which I shall subsequently refer, to care

with regard to the purity of the instruments and hands, and to the provision of very free drainage, so that there is no bagging of the septic materials from the mouth in the neck wound.

The great point is to keep the wound more or less aseptic, at any rate for a few days, till the cellular spaces are blocked by new cells, and till granulation is occurring. One of the most important preliminary procedures is the thorough cleansing of the teeth before the operation, which, curiously enough, is scarcely ever carried out. In cases of cancer of the tongue, especially where the floor of the mouth is the seat of the disease, and more especially in hospital patients, foul material collects about the teeth in large quantities, and is ready to infect the freshly cut surface, and one must remember the important part which dosage plays in the subsequent severity of the disease. Great care must therefore be paid to this matter, for some days before the operation, and at the time, the teeth, both in front and behind, being thoroughly and repeatedly cleaned with a brush and with antiseptic solutions, such as sanitas, permanganate of potash, &c.; and at the time of the operation this should be still more thoroughly carried out, and any bad stumps should be taken away. The patient should also wash out his mouth frequently with the same antiseptic, so as, as far as possible, to get rid of the foul material; and at the time of the operation for cancerous ulcers of the mouth, if they are within easy reach, I generally, when the patient is under chloroform, after drying them, swab them over with undiluted carbolic acid, so as to destroy as far as possible the masses of septic material which are present in the wound. Subsequent to the operation, the use of a 10 per cent. solution of chloride of zinc as recommended by Sir Joseph Lister, or of iodoform in moderate quantities, is of some advantage, but I agree with Kocher that the chief point is the plugging of the wound with antiseptic gauze, such as cyanide gauze sprinkled with iodoform, which is frequently changed, and is of value in soaking up the discharge and preventing its decomposition. I believe, however, that the essential point is the cleansing of the mouth and the wound before and at the time of the operation; and the second essential is that the discharge runs freely away, and in all cases where a communicating external wound is made, one or more drainage tubes of large size should pass freely into the mouth.

As regards the results, it must be confessed that true cures are

comparatively rare, and are not, of course, nearly so frequent as in the breast, but this is to a great extent due, I think, to neglect in taking away enough of the tongue muscles in deep-seated cases, and more especially to not clearing out the glandular area properly. And, further, some surgeons are very apt to look on glandular enlargements, unless very small, as inoperable, and thus abandon patients to their fate who might, I think, still have had a fair chance by operation. Winiwarter gives 2·3 per cent. of cures and 42 per cent. mortality; Konig, 12 per cent. cures and 28 per cent. mortality; Kocher (leaving out the last three years), 18 per cent. cures and 11 per cent. mortality. With regard to Kocher's cures, eight in number (one after operation for recurrence), it must be noted that in two of them cancer again appeared in the mouth 10 and 12 years respectively after the operation; while one died seven years later of cancer of the stomach. The first two cases must, however, I think, be looked on rather as fresh disease than as recurrence of the former.

I feel sure that when the recent work on cancer is more thoroughly applied to the tongue, more especially as regards the removal of the glands, we may look for further improvement in the results. I must not, however, take up more time in considering disease of the tongue; what I have to say about the removal of the glands and the after treatment in connection with pharyngeal disease applies equally to cancer of the tongue, and therefore I shall leave these points till I come to speak of cancer of the pharynx.

The limits of the operation for cure in cases of disease of the tongue are, in my opinion, the following:—Very extensive infiltration of the tongue muscles, especially downwards towards the hyoid bone; extensive affection of the jaw in addition to the tongue; extension to the upper part of the larynx; and involvement of the carotid artery and vagus nerve in the large glandular mass. In these cases I doubt if we can do very much in the way of operation which can be beneficial to the patient. In cases where the glandular enlargement is marked, some surgeons advise the removal of the tongue with the view of taking away the disease in the mouth, which is the most distressing thing to the patient, but an essential for such a procedure is that there shall be a good probability of subsequent non-recurrence in the mouth, and for my own part I think that in most cases where the disease in the mouth is of such small extent as to render it probable that

it will not recur locally after operation, the glandular disease can also be taken away and a cure aimed at. In cases where the glandular enlargement is really inoperable, the removal of the tongue, if local recurrence did not take place, would, no doubt, be of advantage to the patient; but, failing that, we must be content, so far as operative measures are concerned, with such substitutes as division of the gustatory nerve, tracheotomy, &c.

2. Cancer of the Pharynx.

Cancer may begin anywhere in the pharynx, but most commonly (apparently in over 60 per cent. of the cases) it commences in the mucous membrane over the tonsils or pillars of the fauces, and spreads from thence over the neighbouring parts. From the tonsil the disease spreads most often and earliest on to the pillars of the fauces and upwards to the soft palate, next most frequently downwards on to the base of the tongue, and lastly, backwards over the pharynx; indeed, in most cases which come under view, one usually finds most or all of these parts affected, even on the first occasion when one sees the patient. Epithelioma, also, sometimes, though not nearly so commonly, begins about the epiglottis and orifice of the larynx, and the third point of selection is lower down, close to or at the commencement of the œsophagus.

It is remarkable how little trouble the disease causes at an early period; sometimes, as in the ninth case (No. 39, Table III), the patient does not observe anything wrong till the occurrence of bleeding attracts his attention. In other instances, as in Case 4 (No. 127), he first notices a frequent desire to clear his throat, or again, in Case 6 (No. 26), a feeling of uneasiness and dryness about the throat, and, very commonly, pain shooting up to the ear. Indeed, in not a few instances, the first thing which leads him to call in a surgeon is the enlargement of the cervical glands in the neighbourhood of the angle of the jaw. Consequently, as epitheliomata in this region apparently grow very readily and rapidly, it is but seldom that the patient seeks advice before the disease has spread to an alarming extent, and when he does apply, the case is generally regarded as hopeless, and he is condemned to palliative treatment. Nevertheless, as will be evident from the list of cases I have put together, a considerable number of operations have been performed for cancer in this region, the success, however, naturally being limited, owing to the desperate nature of the case and the peculiar position of the disease, to some extent to

the removal having been imperfectly carried out, and also to the limited experience of individual operators, owing to the rarity of the disease.

In considering the question of cancer of the pharynx, it is most convenient to divide this part into several regions, for the method of operation and the results of treatment vary very much according to the part affected. Thus, we may speak of (1) Cancer in the naso-pharynx, (2) Cancer affecting the soft or hard palate alone, (3) Cancer affecting the tonsillar region and spreading from thence to the neighbouring parts, (4) Cancer affecting the pharynx proper, and (5) Cancer affecting the pharynx and larynx. Of these, I have omitted entirely cancer of the soft or hard palate alone, because these cases are comparatively limited and readily dealt with from the interior of the mouth, and also because many of the palate tumours described as alveolar sarcomata and adenoid carcinomata, are in reality quite simple growths, and have no tendency to recur after removal. Nor have I gone into the results with regard to cancer of the naso-pharynx, but I nevertheless mention three cases in which I have operated in this situation, more, however, with a view of putting them on record than for the purpose of discussing this part of the subject. Further, I have in my list included sarcomata as well as carcinomata, and I have done so on account of the great interest of the operative procedures, and the fact that, apart from the likelihood of recurrence, the question whether we have been dealing with a sarcoma or a carcinoma does not materially influence the methods of operation, the functional result, or the result as regards life.

I think I can best give a view of the whole matter if I devote the rest of to-day's lecture to a description of the cases in which I have myself operated, up to the beginning of this year, and then subsequently refer to the tables which have been placed in your hands, giving the operative results which have been attained in this disease. In the first place, I shall describe three cases of disease in the naso-pharynx.

Case 1.—*Lympho-sarcoma of the left side of the Naso-pharynx, involving the Eustachian Tube, and growing from the base of the Skull.*

The patient was a male, aged 46, and was first seen by me on March 9th, 1892. The patient consulted Dr. Urban Pritchard

about a year previously on account of buzzing in the left ear; at that time there was no suspicion of new growth. About six months afterwards he noticed that he was becoming deaf on the left side, and for the last three months he had observed that there was some obstruction of the left nostril. He therefore saw Dr. Pritchard for the second time at the end of February, 1892, and on examination a growth was found on the left side of the naso-pharynx, blocking and apparently involving the Eustachian tube. Dr. Pritchard had a consultation with Dr. Greville Macdonald, and as a result the situation and extent of the growth were described to me, and the problem was put whether any operative interference was possible in the case of a malignant tumour in this region. The patient was particularly desirous, in connection with his private affairs, that if possible some extension of life might be obtained for him.

I took the matter into consideration, and decided that an operation was possible, and accordingly I saw the patient on March 9th, 1892, and found the following state of matters. The patient was in good general health, and had not been losing flesh or strength lately. The various organs of the body appeared to be healthy. The hearing on the right side was normal, on the left side a watch was only heard when applied to the ear; breathing through the left nostril was almost completely obstructed. On looking into the mouth, nothing could be seen beyond fulness of the soft palate on the left side. With the rhinoscope a prominent tumour was evident, projecting on the left side of the naso-pharynx, reaching inwards as far as the septum, downwards to and involving the soft palate, backwards to the back of the pharynx, and upwards to the base of the skull. The Eustachian tube was apparently involved in the growth, and in our opinion it had started from that part. The tumour was slightly ulcerated at the upper part, but there had been no bleeding nor pain. With the finger the outlines of the tumour could be readily made out. It did not seem to extend into the nasal cavity, but it pushed down the soft palate and extended into it. A mass of enlarged glands was felt at the upper part of the left anterior triangle and extending under the sterno-mastoid muscle. This mass was not at all freely movable.

I explained to the patient the extent and seriousness of the operation, and the great probability of recurrence, but as it was of

great importance to his family that he should live as long as possible, he decided in favour of the operation.

On March 13th, 1892, I performed the following operation, assisted by Messrs. Stanley Boyd and Burghard. Just at the time that this case occurred, Dr. Wright had published some papers on the value of chloride of calcium in increasing the coagulability of the blood, and also of fibrin ferment as a styptic, and I therefore asked him to be present and to superintend the use of these substances, for I anticipated that there would be a good deal of bleeding. Accordingly, an hour before the operation, a pint of water containing half an ounce of chloride of calcium was injected into the rectum, and during the operation pledgets of salicylic wool soaked in Wright's fibrin ferment solution were applied to the freshly cut surfaces. Whether as the result of this treatment or not, the fact is that extremely little blood was lost: I do not think more than an ounce or an ounce and a half in all. By means of an oblique incision carried along the anterior part of the sterno-mastoid muscle, a mass of glands was removed from the neck. They were deeply seated, being attached to the fascia over the atlas, the spinal accessory nerve running in front of them. In addition, the fat and tissues in the vicinity were, of course, also taken away. After their removal, the tumour could be felt from the wound, and as it was ascertained that the vessels were in no way involved in it, the further operation was proceeded with.

The next step was the performance of tracheotomy and the insertion of a Hahn's tube. I then proceeded to remove the upper jaw on the left side, the usual skin incisions being made. The periosteum and mucous membrane of the hard palate were, however, detached from the bone and left behind, and the orbital plate of the superior maxilla was also left. After the removal of the upper jaw, the base of the pterygoid process was divided with bone forceps and the process removed; the front of the tumour could then be seen. The next step was to detach the tumour from the external pterygoid muscle, the other tissues outside it, and the soft palate. It was then found to have originated from the periosteum of the base of the skull and to have grown downwards along the side of the pharynx, involving the Eustachian tube in its course. A portion of the Eustachian tube was removed, and the mucous membrane all around the tumour was divided.

The periosteum over the whole roof of the naso-pharynx was then carefully detached as far out as the foramina for the vessels, and as far forward as the disease seemed to extend. A layer of the surface of the bone was then chipped off, and the whole bare surface cauterised with Paquelin's cautery; the hard palate was then stitched to the cheek, and the wound closed with sutures. As has already been said, very little blood was lost, and, as a matter of fact, the preliminary tracheotomy proved to have been quite unnecessary. The operation lasted about two hours.

There was remarkably little shock after the operation, and by the evening it had quite passed off. There is very little to say about the further progress of the case. The temperature only once reached 100° F., and that was on the morning after the operation, and the further progress towards recovery was uninterrupted. It was very extraordinary what an entire absence there was of septic absorption. The tracheotomy tube was left out on the day after the operation, all the stitches were removed on the fifth day, the patient got up on the tenth day, and left town on the twenty-third day.

Very shortly afterwards he was able to resume business, and for about fifteen months there was no sign of recurrence in the nose, although in March, 1893, that is to say, a year after the first operation, I removed some small glands from the left posterior triangle of the neck. In July, 1893, however, he began to have some bleeding from his nose, and accordingly I reopened the scar and found that recurrence had taken place at the roof of the nasal cavity in front of the former seat of the disease, the situation of the original tumour, however, remaining perfectly well. I cleared this part as thoroughly as possible, and for a time he went on very well; but in the spring of 1894, about two years after the first operation, he began to go downhill, bleeding occurring again from the nose, and glands enlarging on the other side of the neck. He gradually became worse, and ultimately died on December 14th, 1894, two and three quarter years after the first operation, having had time to put his affairs in good order and to provide for his family.

Quite recently I have had another somewhat similar case, which I may introduce here.

CASE 2.—*Lympho-sarcoma growing from the base of the Skull and projecting into the Naso-pharyngeal Cavity.*

Female, aged 24. Admitted to King's College Hospital, December 2nd, 1895. The patient had noticed stuffiness in her right nostril as long ago as last August, but thought it was due to a cold, and paid no attention to it. It, however, gradually became worse, and a few days before admission she consulted Dr. W. H. Dobie, of Chester, who diagnosed the condition of matters and sent her up to me. The patient was a young woman in good health, who had not been wasting, and only complained of this feeling of stuffiness in the nostril. Nothing was seen by inspection of the mouth, but with the finger a hard mass was felt through the soft palate, especially on the right side. On examination with the rhinoscope, a rounded swelling was seen growing from the roof of the naso-pharynx and filling up most of the space; no ulceration over it, and it was not pedunculated. With the finger passed up behind the soft palate, a firm tumour was felt which apparently did not extend into the nasal cavity, and was nearly centrally situated; no enlarged glands in the neck.

On December 22nd, 1895, the patient was anæsthetised with chloroform, and the soft palate was split in the middle line, the incision being carried through the mucous membrane and periosteum of the hard palate nearly to the front. The periosteum of the hard palate was then peeled off the posterior part, and by means of a chisel and hammer a curved portion of the back part of the bone of the hard palate, as well as the posterior part of the vomer, was chipped away. The soft parts being held aside by a string passed through each flap, a very fair view of the tumour was obtained, the head hanging down. An incision was then made through the mucous membrane and periosteum over the base of the skull all round the growth, and as far from it as possible, and then the periosteum with the tumour over it were detached. After detaching the periosteum, and after bleeding had been arrested by pressure, the whole raw surface was thoroughly painted over repeatedly with nitric acid, and after the acid had acted for some time, a solution of carbonate of soda was applied to the part. The soft and hard palate were then united with stitches, no dressing of any kind being applied to the wound. The recovery was uninterrupted. The palate united perfectly, and

when the patient was sent home on January 10th, the raw surface was granulating nicely and seemed perfectly healthy. From the second day after the operation the patient was kept in a sitting position.

In this case it will be seen that a totally different method of procedure was adopted to that which was employed in the former case. In the former case, however, the tumour was unilateral, and, as far as one could judge, extended well into the side of the neck, and it did not seem at all possible to get satisfactory access to it from below; in the latter case it was centrally situated, and it seemed to me that the method employed would be sufficient. I must say, however, that of the two plans I believe the former, namely the excision of the upper jaw, or at any rate a temporary resection of it, and removal of the pterygoid process, is much the more satisfactory. In the first case I could see exactly what I was doing, and had no difficulty in obtaining complete access to the whole affected area; in the latter case it was difficult to be quite certain whether I had got well beyond the growth at the anterior part; and though this last plan may be useful in cases where the tumour is quite small and centrally placed, I should be inclined in most cases to employ the former method. The remarkable absence of any septic phenomena in both these cases is very striking, and I attribute it mainly to the free escape of the discharge from the surface of the wound as the result of the position of the patient, and also to scrupulous care in cleansing the mouth and in avoiding the introduction of any septic infection from without. Both cases show that tracheotomy is quite unnecessary in these operations.

The following case may also be added to this group, although here the disease extended further forwards.

CASE 3.—*Spindle-celled sarcoma growing from the roof of the Nasal Cavity, involving the Sphenoidal, Ethmoidal, and Frontal Sinuses, and destroying the upper part of the Nasal Septum.*

The patient was a female, about 40 years of age, sent to me by Dr. Edward Law, and seen on February 14th, 1894. There was a history that the patient had suffered from nasal polypi for 10 years, these polypi being, however, not the ordinary mucous polypi, but evidently of a more or less malignant character. She had been

operated on many times and in many ways. Recently she had been under the care of Professor Volkmann, who had attempted to destroy the growth with the thermocautery, and, as a result, the orifice of the nostril had been much burned and had become so contracted that it was impossible to see into it. The right nostril was completely filled up with growth, which distended the nose and destroyed the nasal bones, and at the bridge of the nose a soft tumour was felt and seen projecting forwards ; the frontal eminence was much more marked on the right side than on the left. The right eye was pushed outwards, and also projected forward. There was no swelling of the superior maxilla, but electric illumination of the mouth showed a greater area of opacity on the right side than on the left. By posterior rhinoscopy, a globular mass with a smooth surface, and of a mucous appearance, was seen projecting into the naso-pharynx and pressing on the right Eustachian tube. The nasal septum was pushed towards the left and almost blocked the left nostril. The patient was a prima-donna contralto, and, curiously enough, her singing voice was unaffected.

On March 7th, 1894, I performed the following operation. An incision was made along the right side of the nose from the frontal bone downwards to the back part of the orifice of the nostril, and the ala and right side of the nose were detached and turned over to the left side, the skin being carefully separated from the tumour in front. The tumour was partly cystic and was gradually separated from its attachments along with as much healthy tissue as possible. It filled and distended the right frontal sinus and projected somewhat into the left, but it came completely away along with the mucous membrane. It opened and projected into the right orbital cavity, and it grew from the whole of the roof of the nasal cavity, especially on the right side, and had destroyed the vomer at the upper part. Great care was taken to remove all the periosteum and the walls of the various cells as far as was consistent with safety. The surface of the bones was then cauterised and sponged with undiluted carbolic acid ; the skin was replaced in position and stitched, and a plug was introduced into the right nostril so as to keep it open during the healing process. The right antrum was also full of pus, and it was opened in the usual manner through the alveolus, and a drainage tube inserted into it.

Here, again, the subsequent progress of the case was absolutely

free from any fever or other cause of anxiety. The temperature did not rise above 100° F., and she left the home within three weeks, apparently well. She remained well till a year ago, since which time I have not seen or heard of her. At that time she was hoping to get an engagement in an opera abroad, and probably was successful. The tumour was a spindle-celled sarcoma.

I have put these three cases together on account of their great interest, but I have not made any attempt at collecting the cases of operation for malignant tumours in the naso-pharynx, and therefore I shall not dwell on them. I have already mentioned the two modes in which access was gained to the tumours in the first two instances, and the remarkable freedom from sepsis in the after progress of all the cases. How far the operation in these cases is worth while, is a matter which is difficult to determine. I believe that in a carcinomatous affection of these parts it would certainly (unless the disease was very extensive) be well worth while, but lympho-sarcoma is notably a very disheartening disease to operate on. Nevertheless, in the first case to which I have referred, the result, although not a cure, was such as to place the patient in a very much better position than if the operation had not been done; and he himself was more than satisfied that the operation he had gone through was well worth the result obtained.

In the following cases we have to do with tumours lower down, in the pharynx proper, or in the neighbouring parts. First a case affecting both larynx and pharynx, then three successful cases, then three fatal ones, and lastly, one where local recurrence took place.

Case 4 (No. 127, Table III).—*Epithelioma of the right side of the Pharynx, the Epiglottis, right Aryteno-epiglottidean Fold, the pharyngeal mass being also adherent to the Thyroid Cartilage.*

Male, aged 42, under the care of Dr. Roxburgh, of Weston-super-Mare. About the end of June, 1892, the patient had a feeling of stiffness about the right side of the throat when he yawned, but he did not pay any particular attention to it, and otherwise he had no trouble or pain. He saw Dr. Roxburgh about it for the first time on July 24th, and he diagnosed a malignant ulcer of the pharynx. The patient came up to town next day and saw a laryngologist, who confirmed the diagnosis,

and thought that the disease might be removed by operation. Two or three days later (on July 28th) he saw Dr. Greville Macdonald, who came to the same conclusion, and who arranged for me to go down and see the case, and, if I approved, to operate. I saw the patient on August 1st, 1892, and operated the same day.

On examination, I found him in good general health, and his various organs were healthy. Nothing was visible on inspection of the throat from the mouth, but with the laryngoscope a ragged ulcer somewhat larger than a shilling was seen on the right side of the pharynx, spreading on to the right aryteno-epiglottidean fold, and possibly as far as the right side of the epiglottis. The vocal cords were normal. As far as any of us who had seen the case could judge, the disease was quite limited: until we came to the actual operation, we had no idea that it had spread superficially in the mucous membrane to the extent which we found had taken place.

The following were the steps of the operation. Preliminary tracheotomy performed and a Hahn's tube inserted; a long incision was then made parallel with the vessels, and a transverse one along the border of the great cornu of the hyoid bone. The vessels were pulled outwards, and the submaxillary gland was raised. It was found impossible to save the superior laryngeal nerve on that side. The pharynx was opened from the side, and the disease exposed. It was found to be much more extensive than had been supposed, because it spread superficially and had not led to any marked thickening of the mucous membrane at the edge of the growth. It reached to the middle line behind, on to the tongue in front, and was adherent to the wing of the thyroid cartilage, but it was very difficult to define its extent on account of its superficial spread. The whole mass was removed, viz., the affected portion of the pharynx, the right aryteno-epiglottidean fold, a small part of the tongue, the greater part of the epiglottis, and a piece of the wing of the thyroid cartilage. The Hahn's tube was left in, and a feeding tube was introduced into the wound.

The patient stood the operation well, the Hahn's tube was changed the next day for another, and as a section of the epiglottis made in the meantime showed that the epithelioma was spreading superficially quite to the edge of the cut surface, the small remaining piece was clipped out. For the next two days the patient went

on very well, but on the 4th August signs of septic pneumonia appeared, and he went very rapidly downhill, and died on the following day.

Case 5 (No. 22, Table III).—*Round-celled sarcoma of the right Tonsil, side of Pharynx, soft Palate, and lower part of the Naso-pharynx.*

Male, aged 45. Sent by Dr. Felix Semon, and seen by me on June 13th, 1894. Six months previously an enlarged gland was removed by another surgeon from the right anterior triangle of the neck, and on microscopical examination was said to be of a simple character. At that time nothing was noticed in the throat. About four months before I saw him, he began to suffer from uneasiness and pain in his throat, but he did not consult anyone till June 13th, when he saw Dr. Semon, who, thinking that it was a case which might be operated on, sent him on to me.

On examination, the right tonsil was seen to be much enlarged, ulcerated, hard, and fixed. The disease extended to the wall of the pharynx and on to the right side of the soft palate, and appeared to be adherent to the external pterygoid process. From the history of its rapid growth (for the history, as I understood it at the time, was but of a few weeks' duration) and its general characteristics, it seemed to me to be infiltrating the tissues around to a great extent, and I thought that there was no reasonable prospect of taking away all the disease, and therefore advised him not to have an operation done, and this advice agreed with that of the surgeon who had previously operated on him, and who came to me with him.

I did not see the patient again till August 29th. I then found that the tumour had increased greatly in size, and was now filling up the pharynx to a considerable extent, reaching well beyond the middle line. It interfered greatly with swallowing, and to some extent with breathing. The tumour was still very hard and ulcerated, but it did not give me the same impression of wide infiltration which it did formerly. I therefore reconsidered the question of operation, and came to the conclusion that it might, after all, be possible to remove the tumour, and seeing that he had not many weeks to live, I put the question of operation to the patient (who, by the way, was a medical man), and he decided in

favour of it. There were one or two enlarged glands in the anterior triangle of the neck at the seat of the former operation.

On September 11th, 1894, I operated as follows:—In the first instance an incision was made along the line of the vessels, the glands removed, and the external carotid artery tied; the cheek was then split from the angle of the mouth to the masseter muscle. An incision was now made through the mucous membrane in front of the growth, the lower part of the pterygoid process was removed with bone forceps, and the affected portion of the soft palate was clipped away with scissors. At this stage it was found that, owing to the throat being filled up with the growth, the patient could not breathe properly during the necessary manipulations, and therefore tracheotomy was performed and a Hahn's tube inserted. By means of a blunt instrument, the tissues in front of the tumour were separated till the internal pterygoid muscle was exposed, and a layer of that muscle was removed with the tumour in front of it. It was then easy to define the upper, posterior, and lower borders of the growth, and the healthy tissue was clipped through well beyond it on all sides. The growth had become adherent to the Eustachian tube, and a small portion of that tube was therefore removed. Hardly any blood was lost. The wound in the cheek and the external wound, which, I think, did not communicate with the mouth, though I am not quite sure, were stitched up, a drainage tube being inserted in the latter.

The patient had practically no shock after the operation, and during the course of the case there was an entire absence of all septic complications, the temperature not once going above 100° F. On the next day, however, the patient had intense pain in his liver, which alarmed me very much, but on inquiry I found that this was a condition to which he was subject, which he termed "Suakim liver," and from which he had suffered periodically since the Egyptian campaign. His treatment for this condition was absolute starvation, and for nearly a week he would not take anything by the mouth, and subsisted on rectal enemata and nutrient suppositories. When this liver trouble had passed off, he was able to swallow fairly well, and there has been no trouble in swallowing since. The tracheotomy tube was left out on the day after the operation. The patient left the home between three and four weeks after the operation, and is still alive and well.

The local result has so far been absolutely satisfactory; there

has been no local recurrence whatever, and the functional result is perfect. There is no difficulty in speaking or swallowing. Although there has been no local recurrence, I found in March of last year that several glands had become enlarged in the lower part of the anterior triangle and under the sterno-mastoid, and I therefore performed a somewhat elaborate operation with the view of clearing them out. Last summer, also, he came to me and pointed out a small gland in the posterior triangle which he thought was enlarging, and I therefore cleared out all the glandular tissue from the posterior triangle and root of the neck, but found none which showed evidence of disease. (In April, 1896, I found two deeply-seated enlarged glands in the upper part of the anterior triangle of the neck, which I removed.)

Case 6 (No. 26, Table III).—*Epithelioma of the left Tonsil and soft Palate, with a large mass of glands in the anterior triangle of the Neck adherent to the vessels, extending under the Sterno-mastoid Muscle, and up to the base of the Skull.*

Male, aged 55, sent by Dr. Felix Semon, and seen by me on October 13th, 1894. The history was that the patient first began to feel uneasiness about the throat during the previous June, and at that time he was treated for gout. In July he noticed a swelling on the left side of the neck, and since that time the throat trouble has steadily increased, and the glands have gone on enlarging. In September he saw a well-known surgeon, who said that the disease was malignant, but that no operation was possible. Dr. Semon, whom he then consulted, having the experience of the preceding case before him, thought that something might be done, and therefore asked me to see him.

His condition at that time was as follows. Towards the upper part of the left tonsil there was a patch of ulceration with a very hard base and edge and a warty surface, which spread on to the pillars of the fauces and involved a considerable portion of the soft palate. There was also a very large mass of glands in the left anterior triangle, extending from the mastoid process downwards to the level of the thyroid cartilage, and passing under the sterno-mastoid muscle. The mass was firmly adherent to the vessels. We came to the conclusion that an operation was

feasible, and accordingly explained to the patient its nature and risks. He at once decided to have it done.

The operation was performed on October 15th, 1894, and I was assisted by Dr. Semon and Mr. Venning. In the first place, a long incision was made along the anterior border of the sterno-mastoid from the mastoid process to about the middle of the thyroid cartilage, and the deep fascia being divided at the lower part, the jugular vein was exposed. It was found that the glands were firmly adherent to the sheath of the vessels, and therefore the jugular vein was tied in two parts below the mass and divided between the ligatures. The vein and glands were then raised in one piece, the deep fascia being divided well to each side, and it was found that the spinal accessory nerve passed through the middle of the mass. It was not, however, actually involved in the disease, and by separating the glands, the nerve was retained intact. The jugular vein was tied at its point of exit from the skull, and the mass of glands, with the vein and all the fat and glands under the sterno-mastoid and well into the posterior triangle on the one hand, and, on the other, right up to and behind the angle of the jaw, was removed. The external carotid artery was next tied, and the posterior belly of the digastric and the stylo-hyoid muscles were divided so as to allow the jaw to come well forward; and then, the head being thrown back over the table, and the mouth held open with a gag, the soft palate was clipped through well beyond the disease, and the mucous membrane was incised all round the area of the growth at a certain distance from it. By means of the finger in the external wound the limits of the growth were defined and the whole diseased mass was clipped out. A large drainage tube was inserted from the external wound, and the skin incision closed at the upper part by sutures.

The patient was a good deal collapsed after the operation, but recovered the same evening, and went on remarkably well. As in the previous case, there was no rise of temperature or septic complication. For three days he was fed by means of rectal enemata and suppositories, but on the fourth day he began to swallow a little, and succeeded fairly well by following a suggestion made by Dr. Semon, which was that he should lie flat in bed with his head turned to the right or sound side and hanging over the side of the bed. The food taken into the mouth in this way

ran down the healthy side of the pharynx, and he was able to swallow a good deal. His power of swallowing very soon increased, more especially as the communication between the wound in the mouth and the exterior became shut off very rapidly. He got out of bed for the first time on the sixth day, and the drainage tube was left out on the eleventh day. I had, however, to put the tube back again a couple of days later on account of accumulation in the wound, and this external sinus remained open for a few weeks, but closed before the end of the year without anything further being done for it.

When I saw the patient last, in the middle of January of this year, that is to say, fifteen months after the operation, there was no evidence of recurrence and he was in the enjoyment of perfect health. (Patient remains well, May, 1896.)

Case 7 (No. 112, Table III).—*Epithelioma of the base of the Tongue and the Epiglottis. A few small glands in the Neck.*

Male, aged 60, brought to me by Dr. C. A. Parker on November 20th, 1894. The history of the case was that for about six months the patient had noticed pain in swallowing, and lately had had neuralgic pains extending up to the ear. When we saw him together, a small mass of enlarged glands was felt at the angle of the jaw on the left side and at the cornu of the hyoid bone, but on looking into the mouth nothing could be made out there without the aid of a mirror. On using the mirror, however, a superficially ulcerated surface was seen at the base of the tongue, especially on the left side, and extending into the hollow between the tongue and the epiglottis, partially filling it up. The epiglottis was also thickened and ulcerated on its anterior surface, but the larynx was free.

On November 23rd, 1894, I performed the following operation. I began by a preliminary tracheotomy and inserting a Hahn's tube. A long incision was then made along the line of the vessels, and another nearly at right angles to it along the upper border of the hyoid bone. The glands were then removed, the external carotid artery tied, and the pharynx opened at the level of the great cornu of the hyoid bone. In order to get a good view of and free access to the base of the tongue and the epiglottis, it was necessary to clip away the cornu of the hyoid bone, but

when this was done excellent access was obtained to the parts. The superior laryngeal nerve was not divided. The epiglottis was then detached from its attachment in the angle of the thyroid cartilage, but was left attached to the tongue. A transverse incision was then made completely across the tongue, well away from the disease, and the posterior part, together with the epiglottis, was taken away. Some bleeding vessels having been tied on the opposite side of the tongue, the external wound was stitched up, a drainage tube being inserted at its lower angle.

The only point of note in connection with the after progress of the case was that the patient had an attack of bronchitis (to which he was very subject), and which began the day after the operation. For two or three days this gave rise to considerable anxiety, but it soon passed off, and otherwise his recovery was uninterrupted. He was fed for four days by rectal enemata and nutrient suppositories, and then he began to try to swallow some milk in addition. This he did not manage at all well, even with his head on one side, for about a fortnight, and then he gradually improved, and was able in another week to take the necessary quantity of food entirely by the mouth.

As regards the mouth and anterior triangle of the neck, the patient still remains well, there has been no recurrence in either situation; the functional result is excellent, he is able to swallow without difficulty, and only extremely rarely does he have a fit of coughing while doing so, and he is in excellent health at the present time, 15 months after the operation. (Remains well, May, 1896.)

In July of last year, however, I noticed an enlarged gland under the middle of the sterno-mastoid muscle on the left side, which increased in size somewhat rapidly. I cut down behind the sterno-mastoid and exposed the growth, and removed it, along with a portion of the jugular vein to which it was somewhat adherent, and with all the fat and glands that I could find in the neighbourhood and in the posterior triangle. While removing it, it gave way at one part, and some fluid containing flakes of epithelium escaped into the wound. I washed the wound out with sublimate, and then sponged the whole surface of the wound thoroughly with undiluted carbolic acid. The wound healed by first intention, except where the drainage tube was, which I had put in on account of the application of carbolic acid, but this also

healed in a very few days, the application of the acid not apparently interfering with the healing at all. For two days, however, he showed considerable signs of carbolic-acid poisoning, curiously enough the first occasion on which I have seen evidence of carbolic-acid poisoning after the application of undiluted carbolic acid to a raw surface.

At the end of December of last year he showed me a small gland on the right side of the neck opposite the right cornu of the hyoid bone, which had increased somewhat in size of late. I therefore removed this gland along with the material in the neighbourhood, and found on microscopical examination that it also was epitheliomatous. The wound healed by first intention, and the patient remains without any further appearance of disease, now about 15 months since the first operation.

You may naturally inquire why I applied undiluted carbolic acid to the wound in the neck in the second operation. My action was founded on my experience in the case narrated in Lecture I, p. 12, and my object was to destroy any epithelial cells which might have remained in the wound.

Case 8 (No. 38, Table III).—*Epithelioma of the right Tonsil, spreading on to the Tongue, floor of Mouth, soft Palate, and side of Pharynx. A mass of glands at the angle of the Jaw.*

Male, aged 44. Admitted to King's College Hospital on June 7th, 1895. For the last few weeks the patient had noticed some hoarseness, and about a fortnight before admission he had found a swelling at the angle of the jaw. This swelling increased rapidly. On examination, a large ulcerated, warty growth was seen on the right tonsil, extending on to the soft palate, pharynx, floor of mouth, and base of tongue. Within the last few days it had interfered with swallowing and to some extent with breathing. There was also pain of an intermittent character running up to the ear. The larynx and epiglottis were free. There was a mass of glands at the angle of the jaw.

On June 12th, 1895, the following operation was performed. In the first place the trachea was opened and a Hahn's tube inserted. A long incision was then made on the right side of the neck, along the anterior border of the sterno-mastoid muscle, and the mass of glands with the material beneath the sterno-mastoid

and the jugular vein was taken away. A second cut was then made parallel to the hyoid bone, and the submaxillary gland with the adherent lymphatic glands removed. The external carotid artery was then tied. The mouth having been opened, the cheek was split from the angle to the masseter muscle. Free access was then obtained to the disease in the mouth. With scissors, the healthy tissue around the growth was divided, the finger in the outside wound pushing aside the carotid artery and vagus nerve, and indicating the limits of the disease. The posterior half of the tongue on the right side was taken away, along with the floor of the mouth at that part, tonsil, pillars of the fauces, part of soft palate, and portions of the pharynx, the whole being removed in one mass. The wound was stuffed with cyanide gauze sprinkled with iodoform. A stomach tube having been inserted, the external wounds were stitched up, a large drainage tube, however, being fastened into the lower angle of the cervical incision, and passing into the mouth; a fresh Hahn's tube was then put in.

There was a good deal of shock after the operation, but the patient had recovered from that by the next morning, and he went on well, the temperature only twice reaching 100°. For four days the stomach tube was left in untouched, and then it was subsequently passed whenever necessary. He began to try to swallow on the 21st June, but without very much success. However, this rapidly improved, and at the time of his death he was able to swallow practically all that was required in the way of nourishment. A fresh Hahn's tube was put in on the day after the operation, and on the second day an ordinary tracheotomy tube was substituted for it and kept in for two days. The drainage tube in the neck was left out on the tenth day. The patient was doing remarkably well, and it was a question whether he should not go home, when on the 7th July, 25 days after the operation, while he was washing out his mouth previously to taking some food, it was noticed that the material was stained with red blood. This rapidly increased in amount, and in three minutes, before assistance could reach him, he was dead, the blood having apparently passed straight down his larynx and choked him.

On *post-mortem* examination it was found that the wound was looking remarkably well, contraction had been going on rapidly, and a good deal of it had become lined with epithelium. At the

lower angle, there was quite a small sinus which ran down to the ligatured external carotid artery, and this ligature had become partially separated. There was no clot whatever in the artery; the lungs, trachea, &c., were full of blood. There was no sign of any recurrence, the disease apparently having been completely removed.

Case 9 (No. 39, Table III).—*Epithelioma of the Tonsil, soft Palate, side of Pharynx, and right side of the Tongue. A large mass of glands in the right side of the Neck.*

Male, aged 56, seen in consultation with Dr. Semon and Mr. Horsley on June 28th, 1895. The history of the case was that the patient was not aware that anything serious was the matter with his throat till three weeks previously, when suddenly a quantity of blood came into his mouth along with some very foul-smelling discharge. For some time previously his throat had been uneasy, but he had not paid any attention to it. A few days before we saw him he had consulted a surgeon, who had refused operation.

On examination, a considerable mass of glands was felt on the right side of the neck at the upper part of the anterior triangle, evidently adherent to the vessels, and extending under the sterno-mastoid muscle. On opening the mouth, a projecting warty mass was seen on the right side of the throat, and extending on to the tongue; it had apparently begun in the tonsil, which was deeply excavated, and from thence had spread on to the neighbouring parts. Only the back part of the tongue was affected, but there the disease went pretty deeply; above it had spread on to the palate, and behind to the side of the pharynx; the epiglottis and the larynx were free. The lower and posterior limits of the disease could be felt. The patient did not complain of any acute pain, but the ulcer was constantly bleeding, and there was much foul discharge from it. The patient appeared to be a robust man, but was not so in reality, his urine contained one-eighth of albumen, and his pulse was quick and readily compressible, frequently numbering 120. From my experience of the preceding cases, especially the last, which was at that time going on extremely well, it was evident that the disease could be removed with a reasonable prospect of success, while it was clear

that the patient had only a very short time to live—probably only a week or two—if nothing were done. The whole matter was therefore put before the patient, special stress being laid on the risks of the operation, and chiefly, as it happened, on the danger of septic pneumonia and septic disease generally; but he expressed himself as most anxious to have the chance.

On July 1st, the following operation was performed, in which I had the advantage of the assistance of Mr. Horsley and Dr. Semon. In the first instance preliminary tracheotomy was done, and a Hahn's tube inserted. An incision was then made along the anterior border of the sterno-mastoid muscle, and the mass of glands, which extended up to the mastoid process and under the muscle, was removed along with the jugular vein, the external carotid artery, and the digastric and stylo-hyoid muscles which were involved. The cheek was then split from the angle as far as the masseter, and the mass in the mouth was removed in one piece, in the same manner as in the last case. It was then found that the internal carotid artery was involved in the growth, and was, in fact, lying almost bare on the surface of the ulcer of the tonsil, so that bleeding would almost certainly have occurred from it in a few days. As the patient was by this time suffering a good deal from shock, more so than any of the other cases, and as his pulse was very small, I feared that the removal of the diseased portion of the artery would produce so much anæmia of the brain as to preclude the chance of his recovery from the shock, and therefore I thought it wiser to peel off the tumour as far as I could from the artery, and then remove it later, when he had somewhat recovered. The wound was then stitched up, the pharynx being packed with iodoform gauze, and a drainage tube was inserted at the lowest angle. A stomach tube was also introduced. Strychnine was given before and during the operation. The Hahn's tube was removed after the operation, and a Parker's tube substituted for it for 24 hours, when it was left out.

For some hours the patient lay in a very collapsed condition, but gradually improved towards evening, and the next morning, after I took out the packing and the tracheotomy tube, he began to mend rapidly. During that day we began to feed him with the stomach tube, and he was able to sit up and wash out his mouth with sanitas at frequent intervals. He went on steadily improving,

his temperature having only once been up to 100° F., till the morning of the fourth day, when he seemed quite himself again. I, therefore, thought that the time had come when the piece of diseased artery might be taken away with safety, and accordingly I gave him a little chloroform, and, dividing the stitches, I passed a ligature above and below the diseased area, tied the vessel, and removed the intervening portion. This was done quite easily, with almost no disturbance of the wound, and no bleeding. The part exposed was then touched with undiluted carbolic acid, with the view of sealing the tissues against septic infection, and the stitches were re-inserted. The patient passed an excellent day, but towards night he began to cough and had much difficulty in bringing up a quantity of tenacious mucus, his temperature began rapidly to go up, and signs of septic pneumonia set in, of which he died on the morning of the sixth day after the operation. It was noticed also on the fifth day that there was paresis of the leg and arm on the left side, and it is possible that this condition, which was no doubt the result of the ligature of the internal carotid artery, may have considerably contributed to the fatal result.

The occurrence of septic pneumonia after all operations in the throat is, of course, very common, quite apart from the severity of the operation, and it so happened that it was a danger to which I specially called attention before the patient decided on the operation; and the only question which exercises me is whether the interference on the fourth day led to it, or whether it would have occurred in any case; and also how far the paralysis which followed the ligature of the artery had to do with the fatal result. I do not think that it would have been wise to have left the diseased portion of artery in the wound for a longer time, and the disturbance caused by its removal was extremely slight, and I can hardly think that the infection occurred at that time. At the same time, it is a perfectly open question whether it would not have been wiser to have risked taking the artery away at the time of the operation.

Case 10 (No. 40, Table III).—*Epithelioma of the right Tonsil, floor of the Mouth, base of Tongue, pillars of the Fauces, soft Palate, and side of Pharynx. Glands in the Neck.*

Male, aged 55, sent to me by Dr. Harvey, and admitted to King's College Hospital on July 22nd, 1895. The first thing that the patient noticed was the swelling of the glands in the neck about two months before admission, and about that time he also had shooting pain about the base of the tongue. About a month before admission he first observed a growth on his tongue. The patient was old for his age, and was not a very strong man, but had no organic disease of any kind. His only complaint was of intermittent shooting pain, inability to move his tongue properly, and frequent presence of blood in his mouth.

On examination, the glands in the anterior triangle were found to be considerably enlarged, more especially towards the angle of the jaw, but also extending as low as the thyroid cartilage. On examining the mouth a large cauliflower growth was seen at the back of the right side of the tongue, which extended on to the floor of the mouth, the right tonsil, and the adjacent part of the soft palate; its further extent could not be made out on account of difficulty in opening his mouth till he was under an anæsthetic, when it was found to extend some distance on to the side of the pharynx. The entrance to the larynx and the epiglottis were free.

On July 24th, 1895, the glands and the neighbouring tissues were dissected out from the anterior triangle, but it was not necessary to remove the internal jugular vein; the posterior belly of the digastric, however, was found attached to the growth and was taken away. A ligature was put round the external carotid artery, but was not tied, and the wound was stitched up. Owing to his condition, I thought it advisable to defer the completion of the operation for a week.

The wound healed by first intention except where the ligature was, and on July 31st, 1895, the second part of the operation was proceeded with. In the first instance the trachea was opened and a Hahn's tube inserted, the greater part of the former incision was re-opened, and the ligature which was lying around the external carotid artery was tied. The incision was then extended forwards under the angle of the jaw, and the submaxillary gland, which had not been removed in the previous operation, was taken

away. The cheek was then split, and half of the tongue freed right down to the hyoid bone, and removed along with the rest of the growth in one piece. A large drainage tube was inserted, the wound was packed with cyanide gauze sprinkled with iodoform, and a tube passed into the stomach. The rest of the incision was then stitched up.

The patient did not have any very marked collapse, and passed a very good night afterwards. The next morning, however, it was evident that his mind was deranged, and he was most difficult to manage, both as to feeding and in other ways; and I may here say that from this time till the end of the case he never recovered his reason. As he had pulled out the œsophageal tube during the first night, it was passed whenever it was necessary to feed him, but he struggled very much against it, and it had to be done by force. Apart from his mental condition, he went on very well for some days, but there was more septic decomposition about the wound than had occurred after any of the other operations. Still, his temperature remained normal till the eighth day, when it became somewhat irregular, going up to about 101° in the evening and falling in the morning. The tracheotomy tube was left out on the day after the operation. On the twelfth day (August 11th) he coughed up a little blood, and a little was seen to be oozing from the wound. Pressure was applied to the carotid and the bleeding ceased, the amount of blood lost being estimated to have been about half an ounce. I was sent for, but being out of town, one of my colleagues ultimately arrived two hours after the bleeding ceased, and he at once tied the common carotid artery low down in the neck, thinking that probably the blood had come from the external carotid artery. Next day it was noticed that there was paresis of the left arm and leg, and this had developed by the following day into complete hemiplegia. On August 14th there was a repetition of the bleeding which had occurred on August 11th, and when I opened up the wound I found that it simply came from the granulations, and it did not again recur.

His condition from this time onwards was a very bad one. He was completely deranged and very difficult to deal with, would not open his mouth, and could not understand what he was told to do. His left side was completely paralysed, including the left side of his pharynx, while we had removed the right side; consequently he could not swallow, and the saliva, mucus, and

discharges accumulated in the wound in spite of all that we could do to prevent it, and no doubt passed down into his lungs. His temperature continued to go up, and he had a good deal of cough. He continued very much in this condition, gradually going downhill till August 31st, when he died, a month after the operation.

On *post-mortem* examination, gangrene of the upper lobe of the right lung was found, with a considerable quantity of pus lying in it. There was white softening of the anterior part of the right cerebral hemisphere as far back as the fissure of Rolando. There was no clot in the carotid artery.

This case was a very unfortunate one, and was especially complicated by the ligature of the common carotid artery, which I must confess I do not think was necessary. At the time when it was done, the bleeding had stopped for two hours, and as was shown afterwards by the recurrence of the bleeding, the blood had not come from the external carotid artery, and this is further evident from the fact that no clot formed in the common carotid after the ligature, so that bleeding could still have gone on. The immediate result of this ligature was the complete hemiplegia mentioned above, and after that the patient had no chance of recovery. I certainly myself would have been very chary about tying the carotid artery under the circumstances which were present. At the same time, I doubt whether the patient would have recovered apart from this occurrence, for my own experience of post-operation mania, of which I have seen five or six cases, is very bad, and I think that as a rule the patients die, and I believe this is the experience of other surgeons. At the same time, the case furnishes a very instructive warning—especially when taken in connection with Case 9 and several cases which will be found in Table III, where ligature of the internal or common carotid artery after operation on the throat has been followed by hemiplegia—showing us that such a procedure is accompanied by the very greatest risk, and should only be done in the absence of any other possible method of meeting the circumstances of the case. Against this statement may be instanced the fact that in the next case (Case 12) I ligatured the internal carotid artery for hæmorrhage without any such result, but in that instance the artery had been compressed in the midst of cicatricial tissue for some months and was very much diminished in calibre, and by

that time no doubt the cerebral circulation had sufficiently adapted itself to the small amount of blood brought by it, and its ligature did not produce any serious effect.

Case 11 (No. 84, Table III).—*Epithelioma of the left Tonsil, pillars of the Fauces, and soft Palate, spreading on to and involving the lower Jaw at the posterior part. A mass of glands in the anterior triangle of the Neck.*

Male, aged 55, sent to me by Dr. Harvey and admitted to King's College Hospital on July 15th, 1895. The patient first noticed tenderness in his throat and gums about six weeks before admission, and very shortly afterwards a swelling appeared in the neck. Thinking that the trouble was due to a bad tooth, one was extracted, but without any good result. There was a mass of considerable size at the posterior part of the left anterior triangle and extending under the sterno-mastoid; this mass was very slightly movable. On looking into the mouth, an ulcer with hard edges and warty surface was seen on the left tonsil, reaching and firmly adherent to the alveolar border of the lower jaw, spreading into the soft palate, and to a slight extent to the gum of the upper jaw; it also reached the floor of the mouth, but had not yet affected the tongue. The patient was a stableman and addicted to drink, but the various organs were healthy.

As the disease was extensive, and the patient somewhat weak, and as I had to leave town for a few days, I thought it would be better to divide the operation into two stages, removing the glandular mass in the first instance and then subsequently the disease in the mouth. Accordingly on July 16th, 1895, I made a vertical incision over the glands and removed them along with the structures which they involved, namely, the internal jugular vein, the external carotid artery and its upper branches, the hypoglossal nerve, the digastric and stylo-hyoid muscles, and all the fat and glands under the sterno-mastoid muscle. As the wound was an aseptic one, I had no anxiety about the matter, and the patient had no bad symptom.

On July 24th I proceeded to the second part of the operation, viz., the removal of the mass in the throat. After performing tracheotomy the upper part of the first incision, which had healed, was opened up and a fresh cut was carried forward from it in a

curved manner over the submaxillary region, and the submaxillary gland, with some enlarged lymphatic glands adhering to it, was removed. This flap of skin, together with the masseter muscle, was then turned upwards and the jaw sawn through in front of and behind the affected part. The interior of the throat could now be well seen, and an incision was made around the growth and it was removed, the pterygoid process being clipped off and taken along with the mass. As a week had elapsed since the ligature of the external carotid artery, I was very much afraid that anastomotic circulation would have been re-established in the part and that there would be great trouble from oozing. To my surprise, with the exception of the skin incision, which bled pretty freely, there was no more bleeding from the deeper parts than if the external carotid artery had just been tied. The wound was packed with cyanide gauze powdered with iodoform, and the greater part of the skin incision was stitched up, room being left at the lower part for the subsequent insertion of a drainage tube.

The patient went on very well without any febrile symptoms, and he was fed for about a fortnight with the stomach tube, passed when necessary. At the end of that time he began to swallow and was soon able to take sufficient fluid nourishment. He was discharged towards the end of August in very good health. In the beginning of October, however, it was found that there was an excavated ulcer in the middle of the scar opposite the part where the angle of the jaw had previously been. Examination of scrapings from the interior of the ulcer showed numerous epithelial cells, and its margins were hard. It was, therefore, evidently a recurrence. The patient was accordingly re-admitted to the hospital on October 7th.

Case 12 (No. 62, Table III).—*Second operation.*

His condition on admission was that he had this hard nodule in the mouth, and the greater part of it was ulcerated. On October 9th, 1895, the following operation was performed:—A curved incision was made from just in front of the ear forwards for about 4 inches, following the anterior border of the lower jaw. A considerable portion of skin above this incision, which was somewhat adherent, was removed. The cheek was split from the angle of the mouth to meet the former incision, and the whole of the upper part was

dissected up, the edges of the wound being well separated, when the recurrence was seen to be much more extensive than was supposed. It involved the masseter and internal pterygoid muscles, and also the ascending ramus of the lower jaw. This portion of the jaw was disarticulated and removed, and the whole of the masseter and internal pterygoid muscles, part of the pterygoid plates, and as much of the scar tissue as possible were taken away. As I was not quite certain with regard to the scar tissue whether I had quite got all the disease, I applied nitric acid to the raw surface; the wound was stuffed, a large gap being left, no attempt at a plastic operation was at that time made. No tracheotomy.

The patient was a good deal collapsed after the operation, but recovered and went on very well till the ninth day, when bleeding occurred from the wound, and on investigation it was seen to come from the internal carotid artery, which was lying free on the surface of the wound. The artery was tied above and below and divided. No symptoms of paralysis followed the ligature of the artery, and the patient went on very well. He was fed with a stomach tube, it being impossible for him to swallow on account of the large opening in his cheek. The greater part of the wound having healed, the hole in the cheek was filled up by a plastic operation on November 20th, 1895, the edges being pared and a large flap of skin being brought over from the back of the neck. In three or four days he was able to swallow very well, and he was discharged on December 11th.

(This patient died at the end of February, 1896, the cause given being increasing weakness and inanition without local recurrence. I did not see him.)

LECTURE III.

In this lecture I propose to discuss the various points raised by the cases of cancer of the pharynx which I narrated on the last occasion, viz., the methods of operating, the after treatment, and the results.

In connection with this matter I have searched the literature very thoroughly for all cases of similar operations on the pharynx, and the result is shown in Table III. In this table I have included cases both of sarcoma and carcinoma for the reason previously stated, but I have excluded instances where the disease only affected the soft palate or the hard palate, and did not extend on to the wall of the pharynx. I have also not included some comparatively trivial operations which have been performed from the mouth; operations, for example, where little pieces of tumour growth have been clipped away or snared, and where the problems which one wishes to consider do not arise. A few operations which appear, at first sight, to come under this head do undoubtedly appear in the first division of the table, but they are very few in number, and I have not sought to add to them, and, on the whole, those included even in the first group have been extensive.

I have also excluded, as far as possible, operations which were manifestly left incomplete; for example, one case often quoted, where the larynx was removed, but where the disease was left in the tonsil and side of pharynx. Such cases are of no value for our purpose. A few have also been left out in which the method of removal employed has been manifestly inefficient, for example, a case by Studsgaard, where a sarcoma was removed by scraping away the tumour. And, lastly, I have omitted two cases which are frequently referred to in the papers which I have read, namely, one by Schönborn and one by Richardson, where large sarcomata in the wall of the pharynx were removed from outside without opening the pharyngeal cavity. With these exceptions, I have, as far as I can find, included all cases that have been published. I am quite aware that some may possibly have been overlooked, and I hope, if this is the case, that my attention will be called to them; and it would be very important, also, if those who have

reported the cases immediately after operation, and in which, therefore, the results still remain incomplete (unfortunately a considerable number), would furnish the information necessary to complete the cases. At the end of the table will be found a reference to a few other operations, which I have met with more than once in the course of my reading, but the details of which I have not been able to find.

Before proceeding to consider the results as shown by this table, I must make some remarks with regard to various points in connection with the operation. It will be seen on studying the various cases that numerous methods have been employed for gaining access to the parts, and some of these methods have been extensively advocated. Perhaps the operation which has gained the greatest popularity is V. Langenbeck's method of gaining access to the tonsil by division of the jaw in front of the masseter. According to this method an oblique incision is made in the anterior triangle downwards to the cornu of the hyoid bone, and then the cheek is divided from the angle of the mouth obliquely downwards and outwards, this incision crossing the jaw just in front of the masseter muscle, and joining the former in the neck. The jaw is then sawn through in front of the masseter, and the parts being held aside the tonsillar region is exposed to view. Many modifications have been introduced in this method, more especially in the way of skin incisions, but to these I need not allude. A very important alteration has, however, been made by Mikulicz, which is coming into vogue, and consists in division of the ascending ramus of the jaw just above the angle, and the extirpation of the whole ramus. A third method, which has also been a good deal employed, is V. Langenbeck's subhyoid pharyngotomy, in which a transverse incision is made in front of the neck through the thyro-hyoid membrane close to the hyoid bone, and the epiglottis being hooked aside, a good view of the interior is obtained. My own opinion, however, is that no particular method can be followed in these cases. They are, as I have already said, rare, and the number which falls into the hands of any one surgeon must be very few, and consequently they will all probably differ from one another in the extent and distribution of the disease; hence, each case probably requires a different method of attack, and the surgeon must carefully plan out each operation for himself, and not follow any definite rules.

I shall not discuss all the various questions which arise with regard to the operation, but shall content myself, as regards the method of operation, by referring to the following four chief points, viz.: (1) the question of preliminary tracheotomy; (2) the control of the bleeding; (3) the removal of the glands; and (4) the methods of gaining access to the primary cancerous mass. After considering these points, I shall then refer to the after treatment and the results.

(1) *The question of Preliminary Tracheotomy.*—It is, of course, an advantage, if one can manage it, to avoid preliminary tracheotomy, for that adds additional complications in several ways. In the first place, it means another wound which must become septic, it means irritation of the trachea by the presence of the tube and the admission of cold air, and it also means very distinct interference with coughing and the power of expelling any discharges which may have entered the larynx. In one of my cases (No. 26) I was able to remove the disease satisfactorily without performing tracheotomy, but here it was located towards the upper part of the tonsillar region, anterior pillar of the fauces, and the soft palate, and the lower part in the neighbourhood of the orifice of the larynx was quite free. Further, the external carotid artery had been tied, so that, partly as the result of the situation of the tumour and partly as the result of the absence of bleeding, there was no need for tracheotomy. In Case 22 I tried to do without tracheotomy in the first instance, but when I came to deal with the tumour in the throat, I found that there was no room for my manipulations inside without completely blocking the breathing space, and therefore I had to perform tracheotomy in the middle of the operation. No doubt, in cases where the external carotid artery is ligatured, and the bleeding is consequently very small, there is not much chance of blood entering the trachea, especially if the head is thrown well back; and in cases where the jaw is divided, and more especially where a portion is taken away, it may also be possible to avoid the risk of blood passing into the lung. Where, however, an attempt is made to remove the tumour without division of the jaw, or without ligature of the external carotid artery, and where the mass fills up the throat, and more especially where it runs down towards the entrance of the larynx and on to the tongue, the necessary manipulations cannot be carried out without interfering with the breathing, and exciting so much effort on the part of

the patient that there is a very great risk of septic discharge and blood being drawn into the lungs; and besides, it is very necessary in these operations, in order to ensure that the disease is as thoroughly removed as possible, that there shall be no haste in their performance, and that the surgeon shall be able to see exactly what he is doing. Some prefer to do the tracheotomy three or four days before the major operation, but I fail to see the advantage of this; on the contrary, it must be remembered that after three or four days the discharge from the tracheotomy wound has become more or less septic, and, consequently, in introducing a big tube, such as Hahn's, some of the pus may be pushed before it into the trachea. It is well to bear in mind that where septic pneumonia occurs by direct entrance of materials into the air passages, and not as the result of a general infection, it is not the entrance of pure blood which sets it up, but of blood mixed with septic discharges, or of pure blood in the first instance fouled subsequently by the inhalation of the putrid materials from the wound.

On looking at Table III, it will be seen that in Group II A the mortality where tracheotomy was performed is double that where there was no tracheotomy, viz., 38 per cent. in the former case to 19 per cent. in the latter; and further, we find that of the fatal cases with tracheotomy (13 in number), seven, or 53 per cent., or 20·5 per cent. of the cases operated on (Nos. 39, 40, 72, 73, 78, 79, and 89), died of septic lung trouble, while only one, or 14 per cent. (No. 52), of the fatal cases without tracheotomy (seven in number), or 2·7 per cent. of the cases operated on, died from the same cause. On these bare facts one would be inclined to regard tracheotomy as a very serious addition to the risk, but on looking into the cases we see that those where tracheotomy was performed were on the whole much more severe, and consequently accompanied with greater danger. Further it will be found that in six out of the seven tracheotomy cases which died of septic pneumonia the base of the tongue was affected, and this was also the case in the patient who died without tracheotomy. It is evident therefore that the seat of the disease had much to do with the fatal result, and I do not think that we can fairly attribute the septic pneumonia to the tracheotomy. At any rate it is clear from these facts that preliminary tracheotomy is by no means an absolute safeguard against septic pneumonia, and I should be inclined to try to do without it where the disease

is high up, or where it is behind the tonsillar region, and where the base of the tongue or the neighbourhood of the glottis are not interfered with. Where the base of the tongue is interfered with, the patient does not swallow nearly so readily as where this is not the case, and consequently discharges are apt to accumulate about the orifice of the larynx and so get down into the trachea subsequently to the operation. Hence, in these cases, I think that it is well not only to perform preliminary tracheotomy, but also to go on with Hahn's tubes for some days after the operation, till in fact the patient has, to some extent, at any rate, regained the power of easy swallowing.

(2) *Control of the Hæmorrhage.*—In most of my cases I have tied the external carotid artery so as to have the seat of the primary tumour free from bleeding, and as regards this point the result has been extremely satisfactory. In none of the cases had I to tie or clamp any vessels with the exception of one or two veins, practically no blood was lost, and the area of the operation being more or less bloodless, one could remove the disease with precision and feel pretty sure that one was cutting wide of it in all directions. The control of the bleeding in this way is of the greatest importance, from the point of view, on the one hand, of the immediate danger of the operation, namely, the entrance of blood into the air passages, and on the other of the radical removal of the disease, but there are very serious objections to it, and I doubt if it is an advisable practice as a general rule. Working so much with aseptic wounds as one does nowadays, one is apt to forget that there is such a thing as secondary hæmorrhage, and that where a wound becomes septic, ligatures around large vessels very commonly ulcerate through, and then the main obstacle to hæmorrhage is the clot in the vessel. In the case of the external carotid artery, little or no clot forms on the proximal side of the ligature, and therefore if it separates too soon there is practically no barrier, and bleeding is very apt to occur. Hence, it has happened that in most of the cases in which the external carotid artery has been tied, severe and sometimes fatal secondary hæmorrhage has occurred from the artery. Thus, in my case No. 31, sudden hæmorrhage from the external carotid artery led to the immediate death of the patient at a time whem one was quite free from anxiety about the case, and priding oneself on the excellent result which had been obtained. In this instance the patient had gone on without a bad symptom, there had been no

sepsis, fever, or anything untoward, the wound was contracting rapidly, the patient was feeling well and able to sit up, indeed, it was a question whether he might not leave the hospital, and, as was shown by the *post-mortem* examination, the disease had apparently been completely removed; and yet on the twenty-fifth day after the operation, it was sudden bleeding from the ligatured end of the artery which choked him before assistance could be obtained. This has also happened in several of Polaillon's cases, who has likewise tied the external carotid artery in most instances, and he has ultimately, as the result of his experience, come to the determination to abandon this procedure. Again, though not directly, yet indirectly, the ligature of the external carotid artery was also responsible for the death of my patient in case No. 40, for, had it not been tied, I think that my colleague would have opened up the wound and searched for the source of the bleeding rather than have immediately tied the common carotid artery. In this case paralysis followed as the result of the ligature of the artery, and that is an occurrence which has happened in other instances. I may refer to cases Nos. 24, 53, and 93 in Table III. It was partly with the view of avoiding this risk that I divided the operation into two stages in Case 84, and in that instance there was no trouble whatever with the ligatured artery, and the result as regards hæmorrhage during the second operation was perfectly satisfactory. In that case the ligature had apparently become firmly healed over before the wound was exposed to septic influences, no large collateral circulation had been established during the interval between the two operations, and there was practically no bleeding from the wound; in fact, less than in the other cases, probably because the internal jugular vein had also been removed at the same time as the operation on the glands and the branches leading to it had become blocked, so that we did not even have venous hæmorrhage. Whether this division of the operation into two stages is a good thing or not, I shall discuss by and bye; it certainly gives us a means of avoiding secondary hæmorrhage from the ligatured external carotid artery, and at the same time gives us a bloodless wound. Failing this division of the operation into two stages, I am inclined, much against my will, to give up the preliminary ligature of the external carotid artery in most cases, and either tie its branches or control the bleeding by temporary compression of the artery during the removal of the tumour. That, however, introduces another problem, namely,

division of the lower jaw, for without that, where the disease is situated in the tonsillar region, one might have difficulty in getting proper access to the bleeding points, while I think it is an advantage, if possible, not to interfere with the jaw. Where, however, for any reason the jaw has been divided, one can get good access to the bleeding points, and need not tie the artery previously.

(3) *The Removal of the Glands.*—The remarks made with regard to the removal of the lymphatic area in cases of breast cancer apply with equal force to these cases. It is seldom indeed that no enlarged glands can be felt, and in most instances they are of very considerable size. Whether glands are felt or not, however, the lymphatic area ought to be cleared out, and as I have already said, one of the great advantages of the cervical region is that a very large glandular area is accessible, and not only can a large portion be cleared out at the time of the operation, but also glandular recurrences beyond the anterior triangle, if seen early, can be freely and hopefully dealt with.

Most surgeons look on the presence of enlarged malignant glands in the neck—unless they are quite small and non-adherent to the vessels, and only one or two in number—as a contra-indication to operation in these and in tongue and larnygeal cases, or, at any rate, as a very grave complication. For my own part, I do not at all agree with this view unless the glandular enlargement is very extensive, or adherent to a variety of structures in the neck and not merely to the sheath of the vessels, and I see no contra-indication to operation in their presence; on the contrary, I think the operation will be more thoroughly done and the patient will have a better chance of recovery and cure if enlarged glands are already present; for, in the first place, where the glands are already enlarged, it is much more easy to remove the whole glandular area in one mass than it is where there are no enlarged glands to be felt; and in the second place, the presence of enlarged glands in the anterior triangle renders it imperative to remove the neighbouring lymphatic area, especially that under the sterno-mastoid muscle, so that if glandular recurrence subsequently takes place, it will in all probability be in the posterior triangle, that is to say in a part which is easily accessible for future operation. Where there is no noticeable enlargement of the glands on the other hand, it is a very difficult matter to take away all the glands and fat in the anterior triangle, while one is very

apt in an extensive operation to leave the material under the sterno-mastoid alone, and yet the glands in that situation are very early infected. Where an attempt has been made to remove this lymphatic area, and where it has not been successful and glandular recurrence subsequently takes place in the anterior triangle, we have in the second operation to deal with glands lying in scar tissue, and their subsequent satisfactory removal is a very difficult and sometimes almost impossible matter. These statements are not in any way theoretical, but are founded on considerable experience in cancer of the tongue and other regions in its neighbourhood, and also on a very extensive experience of radical operations for tubercular cervical glands, where the conditions, as regards operation and recurrence, are very much the same.

In carcinoma of the tonsillar region, the glands which are first affected are those beneath and behind the angle of the jaw, and very soon the chain which lies on the sheath of the vessels becomes attacked, as well as those under the sterno-mastoid muscle at the upper part close to the mastoid process; the lymphatic vessels in these cases seem to run in close relation to the posterior belly of the digastric muscle, so that I have had more than once to remove that structure. Where the disease is situated further forward on the epiglottis, the anterior part of the tongue, floor of mouth, &c., it is the glands in the submaxillary region and those about the great cornu of the hyoid bone which become infected in the first instance.

After the preliminary tracheotomy, the next step then in the operation is the exposure of the anterior triangle and the thorough separation of the fat and glands; and through the same wound the external carotid artery and its branches can be tied or controlled. For this purpose, the best incision is one running along the anterior border of the sterno-mastoid muscle, from the mastoid process above, down to the middle of the thyroid cartilage. The skin incision cannot be too free; the usual mistake that is made is to try to remove the glands through too small an opening, and we must remember that we have not only to take away the enlarged glands in the anterior triangle, but that we must also be able to lift up the sterno-mastoid muscle and remove all fat and glands beneath it, especially towards the upper part.

In the first instance the edge of the sterno-mastoid muscle is exposed, and the skin and fat in front of the incision are turned

well forwards; in the next place, I divide the deep fascia at the lower part of the incision and expose the internal jugular vein. It is very seldom, if the glands have attained any size, that they are not adherent to the sheath of the vessels, and therefore the anterior part of the sheath must be removed; indeed, where adhesion to the sheath is at all extensive (and in fact this is so in most cases of malignant glands), it is well to tie the internal jugular vein in two places at the lower part, divide it, and then peel it up along with the sheath and the mass of glands in front of it. In this way one can make a much better clearance of the anterior triangle than in any other; the lingual and other branches of the vein must, of course, be also tied, and the upper end can be readily ligatured close to its exit from the skull. As the mass is peeled forward, the deep fascia is divided in front and behind, care being taken with the spinal accessory nerve, which usually divides the glandular enlargement into two parts. In none of my cases have I found it actually involved in the growth, and usually without opening the diseased glands they can be separated sufficiently to disentangle the nerve. Next, by the aid of a curved blunt instrument, all the fat and glands must be detached from underneath the sterno-mastoid muscle right up to the mastoid process and well into the posterior triangle, and this material peeled off so as to leave the deep muscles clean. I consider that this is a most important thing to do, for recurrence very frequently takes place under the sterno-mastoid muscle, and it is almost impossible at a second operation to make sure of removing all the disease. If at the first operation there is a large mass underneath the muscle, and more or less adherent to it, the operation need not on that account be abandoned, but the muscle must be divided, or a part of it removed, and full access thus obtained to the seat of the disease.

With regard to the removal of the jugular vein, I may say that it need not give rise to the least anxiety; it does not add anything whatever to the danger of the operation, and I have also often had to do it in cases of operation for tubercular glands without any harm resulting. I have never seen reason to regret having taken it away, but I have more than once regretted that I had not done so, recurrence having taken place in small glands which had been left attached to the sheath and overlooked, but which would have been removed if the vein, sheath, and everything in front of it had been taken away in the manner above described. Besides, I

think that there is another great advantage in removing the vein in these pharyngeal cases, for if a septic thrombus should form in one of the small veins about the wound—as may very likely happen—it cannot get any further, and I have been much surprised at the small amount of septic disturbance in my cases.

Having in this way detached the mass of infected and healthy glands, the question comes whether it should be removed at once, or left attached to the anterior part so as to come away with the primary mass. I have already referred, in speaking of breast cancer, to the risk of infecting the wound by cutting away the breast from the axillary glands during the operation, and in the throat cases also, it is advisable, if possible, to maintain the connection. Where, however, the mass is at all large, this cannot be done, as one cannot see what one is doing at the upper part, and therefore in most of my cases I have gently torn across the connection between the primary tumour and the glands, not cutting the material across in case I should cut into some small diseased gland, and thus infect the wound. Where it is necessary to remove the glands from the submaxillary region, an incision may be carried forward from the upper part of this oblique incision, and will give complete access to the part.

In connection with the removal of the glands, there is one other point to which I may here refer, namely, the advisability of dividing the operation into two stages done on different days, in the first instance removing the glandular mass, and a week or ten days later attacking the primary disease. I did this in two cases, and the plan has advantages as well as disadvantages. The reasons which induced me to do it in these two cases were, in the first place and chiefly, that the patients were weakly, and that both the primary disease and the glandular mass were extensive, so that I feared the shock if the whole operation were done at one time. A second reason was that Case 38 had just previously died of hæmorrhage from the external carotid artery, and I thought that the risk of this would be considerably diminished if the end of the artery, lying in an aseptic wound for some days, were to become buried in new tissue. The third possible advantage of performing the operation in two stages is that the planes of the cellular tissue in the neck would become more or less sealed by organising tissue before being exposed to the septic influences from the mouth. The last is a point on which I do not lay much stress, but the other two points are important.

Against this division of the operation into two stages there is, however, one very serious objection, namely, that after removing the glands, open lymphatic vessels are left which may contain or convey cancerous material to the newly-made wound and thus infect it before the second operation, and this infection, being microscopic, could hardly be eradicated, unless possibly by painting the raw surface with a strong caustic. Case 84, in which I divided the operation into two stages, is the only one in which there has been a local recurrence, and in that case the recurrence was almost immediate, and yet when we had finished the operation, so far as we could judge, we had cut well wide of the growth in all directions and there was no trace of any disease to be seen. Here I am much inclined to think that there had been an infection of the wound from the divided lymphatics, and so strongly am I impressed with this risk, that I would not, as a rule, divide the operation into two stages unless under exceptional circumstances, such as great weakness on the part of the patient, or possibly in some cases where I thought ligature of the external carotid artery would be very desirable, and if I were to do so, I would thoroughly sponge out the re-opened part of the old wound with undiluted carbolic acid.

(4) *Access to the Primary Disease.*—There are many ways in which access has been obtained to the tonsillar region, but it is unnecessary for me to discuss them all. The essential point centres round the question as to whether it is necessary or not to divide the lower jaw, and as regards this we have again two points for consideration, namely, whether it is sufficient to divide the lower jaw, as in Langenbeck's operation, or whether it is not better to remove the ascending ramus altogether, as in Mikulicz's plan. Division of the lower jaw, or removal of the ascending ramus, are of course procedures which it is desirable to avoid if possible. In the first place, the division of the bone must add considerably to the septic risk by leaving a compound fracture in a septic wound, and it also must add to the shock. At first sight these statements seem to be in opposition to the facts as shown by Table III, where the mortality after division of the jaw is 26 per cent., as compared with 35 per cent. where the jaw was not divided; but in the latter case the numbers are a good deal smaller, and four of the seven deaths were due to hæmorrhage, other two also occurred in connection with ligature of arteries, and the seventh from post-operative mania, so that in none could

the retention of the lower jaw be held responsible for the result. In the second place, the divided ends of the bone have in several instances failed to unite, and a false joint has been left. Not that this is always a disadvantage, for where the disease involves the mucous membrane in front of the fauces, between the upper and lower jaws, the subsequent contraction of the wound is very likely to lead to more or less closure of the jaws, which, however, does not cause any very great inconvenience if there is a false joint in front. And lastly, necrosis of the divided ends of the bone has more than once occurred. On the other hand, there are great advantages to be gained by the division of the jaw, and in some cases it is absolutely necessary. When the jaw is divided in front of the masseter, and the two parts pulled aside, especially after division of the posterior belly of the digastric and the stylo-hyoid muscles, and with a skin incision running from the angle of the mouth to the upper part of the oblique incision in the anterior triangle, the whole region of the tonsil and side of the pharynx is completely exposed to view, and can be dealt with as precisely as if one were operating on a cutaneous surface; and if this is done, there is, of course, no necessity for ligature of the external carotid artery, the bleeding points being easily secured. Where the disease involves the periosteum over the jaw, necessitating removal of a portion of it or of the ascending ramus, the view obtained is still more perfect.

As regards the removal of the ascending ramus of the jaw, if the angle is also taken away the functional result is bad, the jaw being pulled over to that side and the lower teeth no longer meeting the upper, consequently the patient cannot masticate solid food. Mikulicz has overcome this difficulty to some extent by dividing the ascending ramus above the angle, and only removing that part, and he states that in his cases the functional result is excellent, while a good view is obtained, and there is no trouble from closure of the jaws as the result of contraction of the wound.

Where the jaw is divided, additional skin incisions are required. Langenbeck's is an oblique one, starting from the angle of the mouth and running to the anterior triangle across the jaw just in front of the masseter, and there are various other incisions made into which I need not go. I believe that where the jaw is to be divided, it is in most cases sufficient to make a curved incision

starting from the oblique one, opposite the angle of the jaw and running forwards along its lower border. By this incision carried well forward the submaxillary region can be cleared, and the flap being turned well up over the cheek, the jaw can be divided and the parts held aside.

With regard to this question of dividing the jaw, I would, however, point out that a marked increase in the space is obtained simply by dividing the posterior belly of the digastric and stylohoid muscles. After this is done, the jaw and the larynx can be pulled forward on that side to a very considerable degree. As I have already said, however, no two cases resemble each other, and the methods must be varied in each instance. In my opinion, the only constant incision is the oblique one, in order to get access to the glands, and to free the vessels so that they can be pulled out of the way when the primary mass is being dealt with. Any further incisions that are made will vary according to the necessity of the case.

In one of my cases, No. 26, I removed part of the soft palate, the adjacent part of the pharynx, the anterior pillar of the fauces, and the tonsil without dividing the jaw, or even making an incision through the cheek, simply by dividing the digastric muscle and then cutting through the mucous membrane in the mouth, well beyond the tumour on all sides, and removing the mass by working partly through the mouth and partly through the external incision. In four cases, by means of a long external incision, and by splitting the cheek to the masseter, I removed in case No. 22 the tonsil, soft palate, and side of pharynx as high up as the Eustachian tube, and in cases Nos. 38, 39, and 40 the tonsil, soft palate, side of pharynx, and part of the tongue. In one, No. 84, I removed a portion of the jaw, and in a recurrent case, No. 62, I divided the cheek according to Langenbeck's incision, and also took away the ascending ramus. In two cases again, Nos. 112 and 127, where the growth was lower down, I simply did a lateral pharyngotomy, but in these instances the tonsillar region was not affected.

As regards subhyoid pharyngotomy, that is to say, division of the thyro-hyoid membrance close to the hyoid bone, I do not think that there is any particular advantage in that in most cases. As I have already pointed out, one ought to open the anterior triangle freely in order to remove the glands in all instances, and

one of the chief objects of subhyoid pharyngotomy, as opposed to lateral pharyngotomy, is to save the superior laryngeal nerve. According to some writers this cannot be done where the subhyoid opening has to be extensive, though that is denied by others who have succeeded in avoiding division of these nerves, but, as case No. 112 shows, this nerve can also be spared in the lateral operation, and I believe one can get better access to the region of the epiglottis and the side of the pharynx and base of tongue by the lateral than by the subhyoid method. In my case, by an incision along the hyoid bone in addition to the usual oblique incision, and removal of the great cornu, I was able to take away the whole epiglottis and the back part of the tongue quite satisfactorily.

As to the method of removing these growths, it must be done by scissors or the knife, and they must be taken away in one piece. I do not think the result is at all satisfactory where the galvano-cautery, or the thermo-cautery, or the ecraseur are employed. It is of the utmost importance to be able to examine the cut surface in its natural state, so as to be quite sure that all the disease has been removed, and this cannot be at all made out if we have a burnt or crushed part to look at. Besides, if a burnt surface is left, a slough must separate, and bleeding is then very apt to occur, and in several of the cases in the accompanying list this has actually taken place.

(5) *Treatment of the Wounds.*—These cases are not, of course, amenable to aseptic treatment, but that is no reason why one should not be as careful as possible not to introduce any fresh septic material, and I am therefore as careful about the disinfection of the skin, instruments, hands, &c., as if the wound could be kept aseptic, and I have been surprised at the remarkable freedom from any general or marked local sepsis in the majority of my cases. It is very much the fashion to rub in iodoform and to plug these wounds with iodoform gauze, but I am not a great believer in the virtues of iodoform as an antiseptic, and cannot attribute the absence of sepsis to its employment. Sir Joseph Lister recommends the application of a 10 per cent. watery solution of chloride of zinc to the wound immediately after the operation, and no doubt it is useful. I believe, however, that the best safeguard against septic troubles is the avoidance of fresh infection at the time of the operation, and the free drainage of

the cavity, and possibly, as I have already hinted, to some extent the removal of the internal jugular vein.

As a preparation for these operations, it is most important to see that the teeth are repeatedly and thoroughly scrubbed, and to order the patient to use a frequent gargle of pretty strong Condy's fluid or sanitas. After the operation I have usually packed the wound for 24 hours with cyanide gauze powdered with iodoform, so as to stop the oozing of the blood, and to prevent the surface becoming covered with clots which would decompose. This is withdrawn on the day after the operation, and is not re-introduced, but as soon as the patient can manage it, he is instructed to frequently fill his mouth with weak sanitas or Condy and let it run out of the tube. After the operation, the skin incisions are stitched up and a large drainage tube is fixed at the most dependent part of the wound, and passing freely into the pharynx. This tube is left untouched for two days, and is afterwards taken out once or twice a day and washed in 1 to 20 carbolic acid before being re-introduced. I generally keep it in for about ten days altogether. Free drainage of the wound is a point of paramount importance. I think that the remarkably smooth progress of the naso-pharyngeal cases was due to the ease with which the discharges were able to flow away from the wound; and in these, as well as in the other cases where the larynx is not touched, I arrange very soon for the patient to be propped up, more or less completely, in a sitting posture. As an external dressing, I use cyanide gauze, which is as easily employed as anything else, and which has the advantage of arresting the decomposition which is going on in the discharges which pass into it.

I have already referred to the tracheotomy tube, and need not say anything further about it. The feeding of the patient is, of course, a point of great importance. Difficulty in swallowing naturally varies in different cases, according to the extent of the operation and the parts removed. In severe cases, where a great part of the pharynx has been taken away, the stomach tube must, of course, be used, and I generally leave one in at the time of the operation for three or four days, and then pass it whenever necessary, taking care that it glides along the healthy side of the pharynx and does not impinge on the granulating surface. In one of the cases, No. 26, the patient began to swallow about the

second day, using a plan suggested by Dr. Semon, namely, hanging the head over the side of the bed with the sound side downwards, and then taking the fluid into the mouth. As a result, it ran down the sound side, and the patient was able very soon to manage quite well. In other cases we have had to use the stomach tube for a considerable time. In No. 38, where a portion of the tongue, tonsil, and pharynx were taken away, one of the most extensive of the operations, the patient began to try to swallow about the tenth day, but he was not able to swallow a sufficient quantity to dispense with the feeding tube till about three weeks after the operation. Much depends also on the closure of the sinus left by the drainage tube, but the finger placed over that while swallowing is going on is usually sufficient to prevent the fluid running out. In the case where the epiglottis and the base of the tongue were removed, it was seven days before he could swallow at all, and between three and four weeks before he could swallow comfortably. Israel states that in the epiglottis operations, the rapidity with which the power of swallowing is regained is much expedited by stitching back the tongue to the mucous membrane over the lower part of the epiglottis, which he preserves if possible. I did not do this in my case, as I had to remove the epiglottis completely, and I think that in few instances of carcinoma of the epiglottis can it be advisable to leave any of the mucous membrane behind. In all of these cases I have combined rectal alimentation with the other for some time.

A few words as to subsequent operations for recurrence. In only one of my successful pharyngeal cases has there as yet been a local recurrence, and on that I have operated. The question of a second operation would entirely depend on the situation and the extent of the recurrence, but one must not assume that having done one large operation any further recurrence is hopeless. Hence I would strongly advise frequent inspection of these cases, at any rate for the first year, so as to be able to detect the first trace of recurrence, and to remove it if possible. A subsequent thorough removal must, however, always be difficult on account of the amount of cicatricial tissue which is present. Judging from a study of the cases in the accompanying list, glandular recurrence is looked on as a very serious matter, but this is a view which, as I have already said, I cannot at all share. To my mind, glandular recurrence, unless it has been neglected and attained a very con-

siderable size, is a comparatively small matter, and I can only repeat that I consider the great advantage which operative treatment in this region possesses over operations elsewhere, is that we have a very extensive glandular area accessible, and that recurrences can be removed very easily. The great difficulty about glandular recurrences is where they take place in the site of the former wound, that is to say in the midst of cicatricial tissue, and this is one of the reasons for the great stress that I have laid on very complete removal of the whole glandular area which is exposed in our incisions. If this area is thoroughly removed, then subsequent glandular recurrence outside the scar tissue is readily enough dealt with. There are very few structures in the neck that cannot be dispensed with, and even if the glandular enlargement has been neglected, if it is only possible to get it away and leave the essential structures behind, that is to say, the vagus and phrenic nerves and the internal carotid artery, it is, I think, a pity, after an extensive throat operation, to leave the patient to his fate. In case No. 112, I removed glands on the left side eight months after the original operation, and as yet there is no further recurrence there, and, I think, further glandular recurrence is improbable on that side, seeing the wide area of healthy material which I was able to take away.

(6) *Results.*—I must now say a few words about the results, as shown in Table III. This Table has been pretty thoroughly analysed at the end, but some explanation is needed, as the bare figures do not at all convey an accurate impression of the results. We must also consider the results in the three great groups separately. In Group A we have operations of varying severity, some quite small, but the majority of considerable extent, some indeed, such as my case of sarcoma of the tonsil (No. 22), very extensive; but the great point of distinction between this group and the next is that the wound in the throat did not communicate with a wound in the neck. Group II comprises the cases which essentially belong to this subject, and in it are included all the cases where the wound in the throat communicated with a wound in the neck. This group I have broken up into three divisions, according to the seat of the disease, viz.:—(1) The upper part of the pharynx with the tonsillar region as the central point; (2) disease at a lower level, in the pharynx proper; (3) cancer of the epiglottis. In Group III we have to do with a

very much more serious condition, where the disease is not confined to the pharynx, but has spread on to and involved the larynx, or *vice versâ*. I shall, in the first place, consider the question of mortality, and then the results as regards cure or benefit, and as regards function.

(*a*) *Mortality*.—In Group I there were 23 cases with two deaths, or 8·6 per cent. mortality, one death being from pyæmia (No. 13), and one from exhaustion after hæmorrhages and recurrence of the disease (No. 9). As regards risk to life, therefore, cases of this class are quite satisfactory. In Group II also the mortality is less than one would expect considering the great severity and extent of these operations, the total result being 91 cases with 27 deaths, or a mortality of 29 per cent. Of the divisions of this group the highest mortality is found in B, where the disease affected the pharynx at a lower level than the tonsillar region, these cases numbering 15 with six deaths, or 40 per cent. mortality. The smallest mortality is in Division C, cases of removal of the epiglottis, where there was one death in six cases, or a mortality of 13·3 per cent. In the main division of this group (A), the tonsillar cases, there were 20 deaths in 70 cases, or a mortality of 28 per cent. Considering the nature of the operations, this cannot be regarded as an excessive mortality, but if we look into the causes of death we shall find that some of them should be avoidable in future. Thus six of the 20 cases died from hæmorrhage (Nos. 24, 25, 38, 41, 51, and 53), four of these after ligature of the external carotid artery, one of the common carotid, and one from hemiplegia after ligature of the common carotid for hæmorrhage. A seventh case also died from hemiplegia from ligature of the internal carotid at the time of the operation. In my case also (No. 40) the ligature of the carotid had much to do with the patient's death, and possibly this may also have been the case in No. 39. Thus in eight or nine of the 20 deaths the cause lay in interference with the large vessels. This is a valuable lesson, and it seems to me that in this respect the mortality in future ought to be distinctly reducible. Of the 20 deaths, eight or nine had also to do with septic trouble, chiefly septic pneumonia. How far we can reduce this cause of death in future it is difficult to say; preliminary tracheotomy is not, as I have already pointed out, an absolute safeguard against this accident. In the total 91 cases belonging to Group II, at least 15 deaths were due to septic

causes = 16·4 per cent. Although this occurrence is, I fear, in some cases unavoidable, still I think much can be done to prevent it, and I look forward to a reduction of the mortality from this cause also. On the whole, therefore, I believe that if the lessons derived from a study of the work done in this department of surgery are borne in mind, there will be a marked reduction of the mortality in future. One difficulty in improving the results, both as regards mortality and also as regards the eradication of the disease, has been the limited experience of individual surgeons owing to the small number of cases operated on, and to the hopeless view which is generally taken of them by those who see them first. I was much struck with an expression used in one paper with regard to Billroth's great mortality after pylorectomy, that it represented the "Lehrgeld," or educational expenses of the operation. In these pharyngeal operations, individual surgeons have had so little opportunity of operating, that their efforts may be looked on as altogether "Lehrgeld," and we have not yet got beyond the educational stage. I hope that the lessons derived from a study of this table of cases which I have collected will enable us in future to pass the educational period; and in that case it is certain that the mortality will fall, and the success will increase in these as it has done in other operations. Even with the present mortality, however, these operations are fully justified, and occupy as good a position as many others which are looked on as perfectly legitimate procedures.

When we come to Group III, we find a much more serious state of matters, for here of 58 cases, 32 died, giving a mortality of 55 per cent. Of these, the chief cause of death was septic pneumonia, which led to 19 of the 32 deaths, that is to say, of the total number operated on, 32·7 per cent. died of septic pneumonia. How far this might be reducible in future is a difficult question, but I think considerable improvement would follow from freeing the divided end of the trachea and stitching the skin all round it so as to isolate it altogether from the pharynx.

(*b*) *Ultimate Results.*—In the whole list of cases there are only four which come under the class cured, that is where three years have elapsed without recurrence, but more may have now passed that limit, for as a rule the cases have been published soon after the operation and there are no further notes of them. Thus it happens that of the 114 cases in the first two groups, no fewer

than 24, or, including operations after recurrences, 30, are marked H?, that is to say, they recovered from the operation, but the further history, at any rate after six months, is not recorded. Some of these may have been cured, or, at any rate, a considerable time may have elapsed before recurrence. Similarly, 14, or, including operations after recurrences, 17, are marked H, that is to say, a considerable period had elapsed since the operation without recurrence. It is, therefore, very difficult to arrive at definite conclusions as to the ultimate result in these operations, but I have attempted to do something in this way, by estimating the cases which were benefited and those which were not, the estimate in both instances, especially in those benefited, showing, however, the worst result. Under those "not benefited," I have placed those which died or recurred early; under "benefited," those which recurred late, or which remained well at the last note, more than six months after the operation. Those marked H? do not come under either group, but most probably, if the further result were known, they would decidedly increase the number of those "benefited," hence, as I say, the latter class is certainly considerably under-estimated, especially in Group II. Letting it stand so, however, we find, as summarised at the end of the Table, that in Group I 30 per cent. were not benefited, 52 per cent. were benefited, and 18 per cent. remains which we cannot classify; in Group II, 54 per cent. were not benefited and 17 per cent. were, while as many as 29 per cent. have to be left out of consideration: in Group III, 81 per cent. were not benefited and 12 per cent. were, while only 7 per cent. are unclassified.

In considering the value of these operations we must take into account the mortality, and we must also remember that we are still in the educational period. As I have already said, I feel sure that with this accumulated experience before us, the mortality can be considerably reduced, certainly in the second group, and possibly also in the third; while there is undoubtedly much scope for greater care and thoroughness in operating, more especially as regards the glands, some of the operations, as will be evident, having been very imperfectly performed. Hence, I look forward not only to less mortality, but also to distinct improvement as regards recurrence. As regards Group I, there can be no question as to the advantage of operation, but with regard to it I would point out that several of the cases would have had a much better

chance had the operation been more extensive, and had they thus come into Group II; and in several of those benefited the result was due more to good luck than to good management. I hope the favourable results shown in this group will not induce surgeons to treat cases in this way which ought to be more thoroughly dealt with. As regards Group II, I think the result is encouraging, for a mortality of 29 per cent., and a mortality which is evidently reducible, is not such as to deter us from giving these patients a chance. Here the present results are that 54 per cent. were not benefited, but that is not more than in many statistics of breast cancer, and not so much as in rectal and intestinal cancer, which are generally recognised as suitable cases for operation. Of these cases the most unfavourable are those where the disease has spread on to the tongue, and it is in these instances that most cases of septic pneumonia have occurred, the numbers being 36 cases where the tongue was involved, with 12 deaths, or 33 per cent., of which seven were from septic pneumonia; four of these 12 deaths were, however, from hæmorrhage and were probably avoidable.

It is where the tongue is extensively involved in addition to the pharyngeal disease that we come, I think, to the limits of these operations. I do not feel, however, able at the present time to lay down definite limits beyond which it is not advisable to proceed. So much depends on the experience and the personal equation of the individual operator. Almost all my cases have been condemned by other surgeons as quite inoperable, and I believe all would have been so condemned had they been seen, and yet not only have three done well, but even two out of the three who died were very nearly successes, and instead of discouraging us give us hope for the future.

When, however, we come to Group III, we have a very different state of matters, for not only is the mortality very high (55 per cent.), but the proportion of those who cannot be reckoned as having got any benefit is very large (81 per cent.). I think, therefore, that in most of these cases the patients will be better off if left alone, at the same time, in a small proportion (12 per cent.) benefit was obtained, and, therefore, I would not necessarily exclude all these cases from operation, but would leave it to the surgeon to judge in the individual case whether an operation is feasible or not.

As to the functional result in the first two groups, it is for the

most part quite satisfactory. It is remarkable how much one can take away in the tonsillar region without causing any great contraction or inconvenience; on the other hand, where pharynx and larynx are both removed, life is hardly worth living except in rare instances, certainly it is not in the case of a poor patient, who would have to spend the remainder of his days in the workhouse.

3. Intestinal Cancer.

I had intended to have made some remarks about excision of the larynx, and Dr. Lack has taken much trouble in collecting cases for me, but time fails me to touch on it, nor can I do much in reference to cancer of the intestinal tract; but I must just say a few words about it, as the operative problems differ in that region from those which we have been considering. Cancer of the intestinal tract is, in itself, more than sufficient for the whole three lectures, and my only reason for introducing any remarks on the subject here is because the point of view from which one regards it is in marked contrast with that in the two situations which I have been dealing with. I think the points of distinction will be sufficiently evident if I confine my remarks to the rectum.

Up till now I have been speaking of cancer in parts where practically the only object in operation was with the view of curing the disease, but here we have a region where, on the one hand, the conditions as regards cure are not so favourable, while on the other, alternative procedures have to be considered which, while they do not aim at cure, often prolong life markedly, and what is more, remove a great deal of the agony of the disease. In cases of intestinal cancer we have to do with a disease which, as elsewhere, varies much in malignancy, but is on the whole less malignant than cancer in the situations which we have been considering. More especially is this true as regards the glandular and metastatic deposits, in which the disease sometimes progresses very slowly, and if only the risks attending the situation of the primary disease can be avoided, the patient may, in the less malignant forms, live for a very considerable time. In accordance with this lesser malignancy, recurrences after operation are not uncommonly late, a considerable proportion taking place after several years. Thus in Czerny's statistics, 10 were well after three years, but four of these (40 per cent.) subsequently showed

disease. Metastases are also late in occurring, and as regards the latter point, Iversen states that in 47 *post-mortem* examinations of long-standing cancer of the rectum (he does not say of how long-standing), he found 21 in which there were no metastases. As regards the hope of cure, however, the glandular area is not nearly so accessible as in the breast or the throat, and therefore, when the disease is of the rapidly advancing form, there is little chance of getting beyond it by operation. Hence the radical operation cannot be so thorough, and were it not for the fact just mentioned as to the lesser malignancy of the disease, chances of benefit by removal of the disease would be very slight. Further, the operations necessary for the removal of the primary disease, more especially where it is high up, are accompanied by a considerable mortality. And lastly, the functional result after operation often leaves much to be desired, both as regards continence on the one hand, and stricture with its troubles on the other. On the contrary, we have in colotomy an alternative procedure which removes the immediate risk to life (obstruction), and thus prolongs life often very considerably, while it also rids the patient of much of his pain and discomfort, by relieving the impending obstruction and by getting rid of the inflammatory condition at the seat of disease, which not only adds much to the patient's discomfort, but also no doubt increases the rapidity of growth of the disease.

Thus we have in these cases a choice of procedures, and it is no longer, as in the former instances, a question of a radical operation or nothing; and further, as the palliative procedure offers much relief, and as only a small proportion of radical operations give any hope of permanent benefit, there is not the same urgent need for radical operation. Hence the question of selection of cases and our mode of advising the patient is much altered. We shall find that in a large proportion of cases the hope of benefit from a radical operation is so very slight that we can without hesitation exclude them from the radical procedure, and at the same time help them much by colotomy; and thus the cases in which the choice of an operation has to be left to the patient are comparatively few. We can, in most instances, say definitely that the case is suitable for the one or the other procedure; there are only a few on the border line that we need leave to the patient to decide.

I cannot enter here into the question of the operative procedures, but I may say that while the perineal operation is suitable in some cases, in the majority it is best to employ one or other of the methods which give good access to the part from behind, such as Kraske's sacral operation, or one of the modifications of it. Where the disease is situated pretty high up, the favourite plan is, after removal of the affected portion, to try to unite the upper and the lower part, and obtain again continuity of the canal. In some few cases this has succeeded very well, and the patient has had more or less perfect control over the evacuations, but in most instances there has been incontinence more or less complete; in some, fistulæ have been present in addition, and in many an amount of stricture has resulted, which has been a source of great suffering to the patient. In some cases, also, where there has been much tension, the bowel has given way, and extravasation of fæces has occurred and led to fatal cellulitis, or peritonitis. If there is incontinence in these cases, the anus is a very difficult situation to keep clean, or to fit with any suitable apparatus; hence where there is much tension, I think it is much better to bring the end of the rectum out in the sacral region, where it can be much more easily kept clean, and in that case one should remove the anal portion altogether, so as not to leave a canal to infect the deeper part of the wound. In the last case on which I operated, I removed the whole of the lower part of the rectum, and applied a ligature around the bowel just above where it was cut off, brought this ligatured portion out in the sacral region, stitched it to the skin, brought together the wound, and left the ligature around the bowel, and in this way for four days we had an aseptic wound. It was not until the end of the fourth day that the ligature cut through and a communication formed with the bowel, and though a small part of the wound in the neighbourhood opened up and suppurated, the greater portion, and especially all the deeper part, remained healed. Where the anus is brought out in this situation, some advantage as regards continence is gained by acting on Gersuny's suggestion to rotate the bowel through an angle of 90°.

Let us contrast the results after colotomy with those after excision. At one time colotomy was of itself an operation with a considerable mortality, and when performed during an attack of obstruction it is so still. At the present time, however, especially as regards inguinal colotomy, the mortality is quite insignificant

when performed apart from obstruction—probably not more than 2 per cent. or 3 per cent., if indeed so much. We may, in fact, disregard the primary mortality of colotomy, and study the results as regards prolongation of life. There are not many good statistics on this point. Erckerlen's old statistics give 45 cases surviving the operation, of whom 22, or 49 per cent., died within a year, and 23, or 51 per cent., lived more than a year, six, or 13 per cent., living over two years. Bryant's statistics are much more favourable. Of 70 cases operated on without obstruction, only 18, or 25 per cent., died within a year, 26, or 34 per cent., died between 12 and 24 months, 16, or 22 per cent., died between 24 and 36 months, and 12, or 17 per cent., were still alive when he wrote. Of 55 which survived the operation for obstruction, 18, or 32 per cent., died in the first year, 19, or 34 per cent., in the second, 12, or 21 per cent., in the third year, and six were still alive, three of them having lived from two and a half to five years after the operation, and one of them alive after six years. Taking the whole 125 cases together, we find that 36, or 28 per cent., died during the first year, 43, or 34 per cent., died during the second year, 28, or 22·4 per cent., died later than two years, and 18 were still alive when he published, some of them also having lived more than two years. These results are, however, remarkably favourable, much more so than any other published estimate. The explanation may, in part at any rate, be that at the present time in a good many of these cases, the disease would have been excised, and only the more advanced and malignant cases would have been subjected to colotomy. At the present time, therefore, cases treated by colotomy do not live, on an average, nearly so long, most of them dying during the first and second year. In a case unsuitable for the radical operation, however, I performed colotomy nearly five years ago, and the patient is still alive, although in the interval a small communication has formed with his urethra.

Let us turn now to the results of the radical operation. The mortality varies considerably between the perineal and the sacral operations, being naturally higher for the latter. Konig's total mortality is 38 per cent., Billroth's 34 per cent., Kocher's 28 per cent., Albert's 18 per cent., Iversen's estimate as regards the Kraske operation 25 per cent., and Czerny with the perineal operation 5·4 per cent., with the sacral operation 19·4 per cent. So far as one can judge from a large number of reports, the

mortality after the perineal operation seems to be about 8 per cent., after the sacral operation from 18 per cent. to 20 per cent., but the results vary much in the hands of different surgeons, probably in accordance with the selection of cases and the after treatment of the wounds, and in both instances it can in all likelihood be somewhat reduced in the future. As matters stand, however, we have to contrast colotomy, in which the mortality is practically nil, with excision, where the mortality varies from 5 to 20 per cent.

Let us next consider the results, and I shall not weary you with elaborate statistics, but take as examples three papers in which the cases are detailed, and which, therefore, I have been able to control and work out myself. I had intended to inflict another Table on you, and my friend, Dr. Macan, has spent a good deal of time in hunting up results for me, but as I found that I had no time to go at all fully into the matter, I gave up the project.

1. Kocher's statistics, as given by Arndt, show 35 cases of radical operation with 10 deaths, a mortality of 28 per cent. Excluding the last three years, as we did in the breast, we have 25 cases with seven deaths (28 per cent.), 11 recurrences (44 per cent.), and seven without recurrence (28 per cent.). In four of the recurrent cases, however, marked benefit was obtained, for two were again operated on and remained well three and eight years subsequently, while in two the recurrences were very late, three and five years respectively. The seven which did not recur had been free for $3\frac{11}{12}$, $5\frac{10}{12}$, $6\frac{7}{12}$, $8\frac{11}{12}$, $13\frac{1}{4}$, $16\frac{1}{6}$, and $16\frac{1}{2}$ years. To summarise this result, 14, or 56 per cent., did not benefit by the operation, while 11, or 44 per cent., did benefit to a marked degree.

2. Take Czerny's statistics as given by Heuck and Loewinsohn (I do not include Schmidt's report, because most of his cases are too recent). These statistics do not include any sacral operations; 41 cases, three deaths (7 per cent.), 21 early recurrences (51 per cent.), eight late recurrences from 17 months up to five and a half years (16 per cent.), four well over six years (9 per cent.), two died within the first year without recurrence. Thus there was no benefit in 24 cases (58 per cent.), and marked benefit in 14 (34 per cent.).

3. Konig's statistics, as given by Hildebrand, represent perineal and sacral operations, and comprise 54 cases with 21 deaths (38 per cent.). Leaving out the last three years, we have 34 cases

with 17 deaths (50 per cent.), six early recurrences (17 per cent.), five late recurrences (12 per cent.), three remained well for from three and three-quarters to five years (8 per cent.), and the remainder cannot be classified. The total is 23 not benefited (67 per cent.) and eight benefited (23 per cent.). Of five apparently well for three years, two subsequently recurred (40 per cent.).

We may say, therefore, that of these 100 cases 61 were no better off than if they had been left alone, and not so well off on the whole as if they had had colotomy done, for 27 of them died at once. These results are not in any way better, indeed not so good as in the pharynx operations. On the other hand, 33 gained advantage, and most of them very marked advantage, from the radical operation, much greater than colotomy could have given. From this we see that of every 100 cases subjected to the radical operation in Germany only about 35 are really likely to be benefited by the operation, and 60 would be better off if left alone or with colotomy, for in Germany the radical operation is carried to an extreme extent, adhesion to bladder and prostate not even forming a contra-indication; indeed, Genzmer goes so far as to advocate the operation even though there are already metastatic deposits in the liver. As even in Germany, about 20 per cent. to 25 per cent. of the cases applying for relief are not deemed fit for the radical operation, we may say that, taking all patients together as they come to the surgeon, not more than 20 per cent. will be benefited by the radical operation; the remainder will do better left alone or with colotomy. If we study the successful cases, it appears that in the great majority of instances where real benefit was derived from the operation, the disease was low down and was not adherent to surrounding structures: the cases of success as regards prolonged freedom from recurrence where the disease was high up or adherent to surrounding structures such as the prostate, are quite few in number. In this matter I quite agree with the tendency of the English school of surgery as opposed to the German, and would exclude from the radical operation cases of rapid growth; cases where the disease forms large masses in the intestine or is deeply ulcerated; cases where it has passed through the wall of the rectum and invaded surrounding parts, as indicated by fixidity; and rapidly growing tumours high up, even though not yet fixed. In none of these is there any real prospect of cure, or of marked prolongation of life. In the fixed tumours, local recurrence is

almost certain to take place early, and the last condition of the patient will be worse than the first; where the tumour is rapidly growing, glandular infection is widespread and the chances of getting beyond the disease are very remote, while, on account of the rapidity of growth, the glandular disease and the metastatic deposits will soon end the life of the patient. In none of these cases is it worth while for the patient to run a considerable risk, for it is just in these cases that the mortality is highest, while in colotomy, performed when necessary, we have a means of relieving the patient's sufferings and of giving him as long a period of life with practically no risk.

The conditions higher up the intestinal canal, as met with in practice, are still more unfavourable for radical operation, both as regards the chances of freedom and the risk, but, nevertheless, in a good many instances extirpation has been carried out with distinct advantage. The various methods of intestinal anastomosis, however, present an excellent substitute, and as the mortality of this operation has markedly decreased of late, only really favourable cases need be subjected to the radical operation.

I must, however, bring these remarks to a close. I am well aware how far my effort has fallen short of the aim I set before me, or of what is due to this Society. I have tried to point out that by thorough removal of the disease a considerable proportion of cases may remain free from recurrence for a long time or altogether, and to emphasise the point that if real benefit is to be conferred by operation on sufferers from cancer, we must not only look at the visible disease, but must also take into account the probability of its dissemination and the paths along which it may have spread. We must, in fact, look on the primary disease, the lymph channels leading from it and the first chain of lymphatic glands as, so to speak, one complete organ, which must in most cases be rooted out if the patient is to be freed from his trouble. If such operations are done at all they must be done thoroughly, and the ultimate result depends on the thoroughness with which all traces of disease are taken away. The Biblical exhortation, "Whatsoever thy hand findeth to do, do it with all thy might," is as applicable to surgery as it is to all other matters of life.

TABLE I.

All the cases of Cancer of the Female Breast since 1890 (*verified by Microscopical Examination*), *in which the first Operation was performed by* MR. WATSON CHEYNE.

A.—CASES WHERE 3 YEARS AT LEAST HAD ELAPSED SINCE THE OPERATION.

No.	Age.	Date of Operation.	Disease noticed for about—	Seat and Extent.	Nature of Operation.	Results up to February, 1896.		
						External Recurrence.	Metastatic Deposit.	No Recurrence as yet.
1	52	21/1/90	2 years ...	Nodule, size of walnut; numerous small hard glands	Usual	No	No	Well, 6 years later. CURED.
2	47	11/2/90	2 years ...	Large tumour, glands small, marked cachexia	Usual	?	Abdominal swelling developed 9 months after operation. Died 21 months after operation	
3	40	25/3/90	1 year ...	Large tumour, above and internal to nipple, adherent to skin and muscles. Glands	Usual and portion of pectoral muscle	In 6 months. Nodules on rib	Probably mediastinal growth	
4	38	20/5/90	2 months ...	Largish mass above nipple A good many glands	Usual...	No	No	Well, 5 years 9 months later. CURED.

A.—Cases where 3 years at least had elapsed since the Operation— *continued.*

No.	Age.	Date of Operation.	Disease noticed for about—	Seat and Extent.	Nature of Operation.	Results up to February, 1896.		
						External Recurrence.	Metastatic Deposit.	No Recurrence as yet.
5	50	4/11/90	Paget's Eczema 2½ years. Tumour in breast noticed for 6 months	Elongated mass external to nipple, adherent to skin; nipple retracted, flattened and eczematous. Glands in axilla	Usual...	No	No	Well, 5 years and 3 months. CURED.
6	47	14/2/91	2 years ...	Tumour adherent to skin; glands affected, but not very large	Usual...	No	No	Well, 5 years. CURED.
7	49	24/2/91	9 months ...	Marked general enlargement of breast. Extensive glandular affection. Marked cachexia; very bad case	Usual. Very large amount of skin removed. Skin grafting	No	Lungs. Died in about 18 months	
8	33	24/3/91	1 year ...	Large mass in outer side of breast. Large glands. Very weak. Cachexia.	Usual. Large amount of skin. Skin grafting	Small nodule in skin near angle of scapula Excised, 24/3/92. No further local recurrence	Masses in abdomen (? ovary). Died, 17/2/93	
9	52	31/3/91	Nearly 2 years	Ulcerated tumour below and outside nipple. Glands enlarged but not big	Usual...	No	No	Lived 3 years and 5 months, then died of acute bronchitis. No return. CURED.
10	46	22/10/91	Some months	Diffuse. Skin involved. Glands. Nodules found in fat on operating	Usual...	Recurrence in skin in 8 months	Died of cancer of pleura, 14 months after operation	
11	63	23/10/91	18 months ...	Small, diffuse tumour. Glands	Usual	No	No	Well, 4 years and 3 months. CURED.

12	44	3/11/91	6 months ...	Large mass in breast. Glands: one large one	Usual. Glands removed from portion; triangle	Recurred?	... ...	Well, 2 years and 2 months later; recurred and has been again under treatment elsewhere last year.
13	56	27/11/91	3 years ...	Size of hen's egg. Glands considerably enlarged. Atrophic scirrhus	Usual...	No	No	Well, 4 years and 2 months. CURED.
14	62	9/12/91	3 years ...	Gland a good deal shrivelled, skin adherent, not ulcerated; numerous small hard glands. Atrophic scirrhus	Usual...	No	No	Well, 4 years and 1 month. CURED.
15	49	11/12/91	10 months ...	Tumour, size of pigeon's egg, on outer side of nipple. Adherent skin. Glands affected, but not very large	Usual...	No	No	Well, 4 years and 1 month. CURED.
16	59	15/3/92	9 months ...	Large mass over upper and outer quadrant. Skin adherent and red. Glands	Usual, but very extensive removal of skin at the outer part	No	No	Well, 3 years and 10 months. CURED.
17	63	31/5/92	2 years ...	Large mass towards axillary part of breast, adherent to skin. Glands	Usual...	No	Deposit in lower part of spine. Much pain in back and leg. Died 21 months after operation	
18	43	27/9/92	6 months ...	Extensive hardness of upper and outer quadrant. Enlarged glands in axilla and puckering of skin over the lower ones. Glands in supraclavicular fossa; very bad case	Usual, but very extensive. Glands removed from above clavicle	Local recurrence. Seen about a year afterwards. Inoperable		
19	42	12/12/92	3 months ...	Mass in upper and outer quadrant. Skin puckers but is not involved. Glands involved but not large	Usual; a good many glands affected	No	No	Well, 3 years and 1 month. CURED.

A.—Cases where 3 years at least had elapsed since the Operation—*continued.*

No.	Age.	Date of Operation.	Disease noticed for about—	Seat and Extent.	Nature of Operation.	Results up to February, 1896.		
						External Recurrence.	Metastatic Deposit.	No Recurrence as yet.
20	57	7/1/93	4 months. Cyst (in degenerating cancer?) opened and drained by another surgeon	Diffuse soft cancer of breast; a good many glands. Sinus leading into the breast. Skin adherent all over; very bad case	Extensive operation; portion of pectoralis major removed	Recurred in lower remaining part of pectoralis; about 18 months later, removed; again recurred towards upper part of axilla and removed. Now again recurred at root of neck, and inoperable. Still alive		
21	43	21/2/93	Nearly a year	Tumour involving greater part of breast and adherent to skin and deeper parts. Glands infected but not large	Usual, and part of pectoralis major	No	No	Well, almost 3 years. CURED. (Still well, May, 1896.)

Total, 21 cases. No deaths from the operation.

12 cured, *i.e.*, well for more than 3 years.

9 recurred { 5 external recurrences, 3 of them with metastatic deposits as well.
1 recurrence (? external).
3 metastatic deposits without external recurrences.

In percentages 57% cured, 42·8% recurred.

The patients "cured" have lived 6 years, 5 years 9 months, 5 years 3 months, 5 years, 4 years 3 months, 4 years 2 months, 4 years 1 month (2 cases), 3 years 10 months, 3 years 1 month, 3 years; one died—well, 3 years and 5 months after the operation.

B.—CASES WHERE 3 YEARS HAVE NOT YET ELAPSED SINCE THE OPERATION.

No.	Age.	Date of Operation.	Disease noticed for about—	Seat and Extent.	Nature of Operation.	Results up to February, 1896.		
						External Recurrence.	Metastatic Deposit.	No Recurrence as yet.
22	47	19/4/93	Glands first noticed 4 months ago, then found tumour in breast	Extensive mass in centre of breast. Glands in axilla enlarged	Usual...	In 4 months. Died 10 months after operation		
23	60	1/5/93	7 months; rapidly increasing	Large mass in upper and outer quadrant of the breast. Puckering of skin. Extensive glandular enlargement	Usual, and sternal origin of pectoralis major and the pectoralis minor	Recurred 3 months later in skin around and developed into a cancer *en curiasse*		
24	76	9/5/93	6 months ...	Large mass in axillary portion of breast, adherent beneath. Glands	Usual, and part of pectoralis major	No	Died 6 months later of intestinal obstruction. (? Tumour in abdomen.) No post-mortem examination	
25	62	17/7/93	2 years ...	Large hard mass beneath left nipple, adherent to skin and parts behind. Glands in axilla	Usual, and part of pectoralis major	... ...	... ...	Cannot trace case.
26	47	11/10/93	Has had some induration of breast since a blow six years ago. For last 2 years, noticed increase	Hard mass in inner half of breast, adherent to skin. Enlarged glands in axilla.	Usual. Had to skin graft part of incision	No	No	Well, 2 years and 3 months.

B.—Cases where 3 years have not yet elapsed since the Operation—*continued.*

No.	Age.	Date of Operation.	Disease noticed for about—	Seat and Extent.	Nature of Operation.	Results up to February, 1896.		
						External Recurrence.	Metastatic Deposit.	No Recurrence as yet.
27	50	4/11/93	Some months	Diffuse hardness of upper part of breast. Glands	Usual...	No.	No	Well, 2 years and 3 months. In September, 1884, there was a good deal of swelling of the arm, and as it did not go down I opened up the axilla in November, but found no disease.
28	45	27/12/93	2 months ...	Lump below and external to nipple; skin not involved. Glands	Usual, and lower part of pectoralis major	... ...	... ...	Lost sight of.
29	69	24/1/94	15 months ...	Mass size of orange behind and to inner side of nipple. Skin adherent and red. Mass in axilla. As it turned out an inoperable case	Usual, and pectoralis major. Was unable to remove axillary mass as it extended high up and involved all the structures	Recurred locally and in axilla within a year		
30	52	7/3/94	6 months ...	Mass below and internal to left nipple; adherent to skin. Glands in axilla	Usual...	No	No	Well, 1 year and 11 months.
31	48	7/3/94	2 years ...	Upper and inner quadrant of right breast. Small lump adherent to skin and pectoral. Glands in axilla	Usual, and portion of pectoralis major	No	No	Well, 1 year and 10 months.
32	45	21/3/94	1 month ...	Mass behind nipple. Marked retraction. Skin adherent. Glands	Usual...	No	No	Well, 1 year and 10 months.

33	51	1/4/94	?	Diffuse mass behind nipple. Skin adherent Mass of glands in axilla	Usual, and piece of pectoralis major	No	Shortly afterwards began to complain of pain in the back and limbs, and gradually got weaker, and died about 15 months later. Probably recurrence in vertebræ. No post mortem.	
34	47	18/5/94	3 months ...	Mass in middle of breast. Glands in axilla	Usual...	... ...	... ...	Died immediately after the operation. The ether led to a great secretion of mucus, and she seemed quite unable to get it up, and was very blue. I think she died chiefly of ether leading to filling of the bronchi with mucus which, owing to her collapsed condition, she was unable to cough up.
35	54	22/5/94	2 years ...	Large mass above left nipple. Skin adherent. Numerous glands in axilla	Usual, and portion of muscle	No	No	Well, 1 year and 8 months.
36	58	26/5/94	Cyst tapped 6 years ago. Some thickening remained. 6 months ago lump began to grow.	Large mass in upper and inner quadrant of left breast. Skin adherent. Glands in axilla and above clavicle	Usual, and a good deal of pectoral muscle and glands above clavicle	A year later further glands in neck removed. In September, 1895, recurrence in connection with inner end of fifth rib removed. Still very well, but recurrence over rib.		

B.—Cases where 3 years have not yet elapsed since the Operation—*continued.*

No.	Age.	Date of Operation.	Disease noticed for about—	Seat and Extent.	Nature of Operation.	Results up to February, 1896.		
						External Recurrence.	Metastatic Deposit.	No Recurrence as yet.
37	54	30/7/94	6 months ...	Large diffuse mass on outer side of left breast. Skin adherent. Numerous small hard glands	Usual, and piece of pectoralis major	No	No	Well, 1 year and 6 months.
38	58	29/8/94	5 months ...	Mass, size of hen's egg, in lower and outer part of left breast. Several nodules extending towards axilla, and enlarged glands there adherent to skin and muscle	Usual, and lower part of pectoralis major	On 24/4/95 a subcutaneous nodule over edge of latissimus dorsi removed	Later recurred in abdomen. Died about 14 months after operation.	
39	About 50	6/10/94	9 months ...	Tumour in upper part of left breast. Some small glands	Usual...	No	No	Well, 1 year and 4 months.
40	62	17/10/94	4 years ...	Mass in upper part of right breast. Skin adherent and ulcerated. Several small glands	Usual and piece of pectoralis major	No	No	Well, 1 year and 3 months.
41	34	6/2/95	8 months ...	Hard mass on outer side of right breast. Adherent to skin and muscle. Enlarged axillary glands	Usual, and a good deal of the pectoralis major	No	While recovering from the operation she complained of much pain in her back (sacral region) and on enquiry we found that she had suffered from this for 4 months. She gradually lost flesh and died, after having much pain in the back, 6 months after the operation. Probably spinal deposit.	

42	48	17/4/95	5 months ...	Diffuse hardness on outer side of left nipple with retraction of nipple and much puckering and adhesion to the skin. Enlarged glands	Usual, and lower part of pectoralis major	No	No	Well, 9 months.
43	50	5/6/95	4 years ...	Atrophic scirrhus on right side. Skin adherent but not ulcerated. Glands slightly enlarged	Usual...	No	No	Well, 7 months.
44	38	5/6/95	5 months ...	Mass in upper and outer quadrant of left breast, adherent to skin and slightly to deeper parts. Glands small	Usual...	No	No	Well, 7 months.
45	54	14/6/95	3 months ...	Mass in outer and lower quadrant of left breast. Skin adherent Glands enlarged	Usual...	No	No	Well, 7 months.
46	45	19/6/95	6 months ...	Tumour in left breast. Skin adherent Glands small	Usual...	No	No	Well, 7 months.
47	46	3/7/95	10 months ...	Mass in outer side of right breast. Adherent to skin and also deeply. Glands enlarged	Usual, and portion of pectoralis major	No	No	Well, 6 months.
48	49	10/7/95	6 months ...	Mass on outer side of breast. Adherent to skin which is red. Enlarged glands	Usual...	No	Probably	Died March, 1896, of "cough and weakness," probably recurrence.
49	58	16/7/95	3 weeks ...	Mass on outer side of left breast. Adherent to skin. Enlarged glands	Usual...	No	No	Well, 6 months.
50	44	16/7/95	1 year ...	Mass in lower and outer part of left breast. Small glands	Usual...	No	No	Well, 6 months.
51	About 50	23/7/95	1 year ...	Hardness behind nipple and on outer side. Puckering of skin. Enlarged glands	Usual...	No	No	Well, 6 months.
52	51	29/7/95	18 months ...	Mass in outer side of left breast. Adherent to skin and pectoralis. Glands	Usual, and piece of pectoralis major	Nodules on ribs Jan. 1896; inoperable.		

B.—Cases where 3 years have not yet elapsed since the Operation—*continued.*

No.	Age.	Date of Operation.	Disease noticed for about—	Seat and Extent.	Nature of Operation.	Results up to February, 1896.		
						External Recurrence.	Metastatic Deposit.	No Recurrence as yet.
53	56	21/8/95	2 months ...	Mass in outer part of right breast. Small glands	Usual...	No	No	Well, 5 months.
54	55	3/9/95	18 months ...	Largish mass in lower part of left breast. Marked glandular enlargement	Usual...	No	No	Well, 4½ months.
55	? 60	3/9/95	2 years ...	Atrophic scirrhus in left breast. Small glands	Usual, and a good deal of pectoralis major	No	No	Well, 4½ months.
56	45	26/9/95	6 months ...	Large mass in left breast, extremely anæmic. Great menorrhagia. Glands: Probably metastasis	Usual, and most of pectoralis major and minor	No	Healed well, but became gradually weaker, and died 3 months later. Nodules could be felt in abdomen. No doubt cancerous	
57	59	13/10/95	Some months	Diffuse mass above left nipple adherent to skin. Large glands in axilla. Bad case	Usual...	No	No	Well, 3 months.
58	55	16/10/95	7 months ...	Tumour in lower and inner quadrant of left breast, adherent to skin, and slightly to deeper parts. Enlarged glands	Usual...	No	No	Well, 3 months.
59	47	3/11/95	9 months ...	Small cancer in breast. Small glands	Usual...	No	No	Well, 2½ months.
60	39	28/11/95	6 months ...	Tumour diffuse, especially at upper part of right breast. Numerous glands. Bad case	Usual..	No	No	Well, 2 months.

61	32	5/12/95	3 weeks	...	Small cancer at axillary end of left breast. One enlarged gland. Quite early case. Very bad family history	Usual...	...	...	No	...	...	...	No	...	...	...	Well, 1½ months.

Total number of cases where 3 years has not yet elapsed since the operation = 40, of these—

1 died of the operation.
2 have been lost sight of.
26 have had no recurrence as yet.
11 have shown further disease { 6 recurred locally; in one (No. 29) visible disease left behind.
5 had metastatic deposits alone; one of these (No. 56) was really an inoperable case, and in two cases (Nos. 24 and 48) I only assume that there were internal deposits.

In percentages, 65% remain well, 27·5% recurred.

The total is 61 cases. In 38, no recurrence = 62%. In 20, recurrences or metastatic deposits = 32%.

Excluding the cases operated on during 1895, which may be said to be too recent, we have 40 cases, of which—

21 remained well = 52%.
16 have shown further signs of cancer = 40%; one of these (No. 29) was really inoperable, and in one (No. 24) I am not sure whether there was a deposit or not.
2 lost sight of.
1 died after operation.

One other interesting calculation is to follow those cases which lived for a year after operation without further sign of cancer, thus showing the chances of a patient where a year passes without recurrence = 25 (including 2 recurrences about which I am not sure), of these—

20 remain well.
1 died—well after more than 3 years.
4 showed further signs of cancer (Nos. 7, 12, 17, 20), but in two of these (Nos. 7 and 17) the recurrence may have been noticed before the end of the first year.

This shows that the chance of recurrence is very slight if a patient is absolutely well after a year.

Table II.

Statistics of Breast Operations.

Operator.	Total Cases.	Mortality.	Known Recurrences or Deaths from Metastases.	Cures.	Cases done more than 3 years before the Report.				—
					Total.	Mortality.	Recurrences (or Metastatic Deposits).	Cures.	
Fischer (Henry)	147	20%	55%	8%	86	22%	59%	15%	13 cures.
Esmarch (Oldekop)...	229	10%	44%	10%	171	13%	(?)	14%	25 cures.
Before 1863	—	—	—	—	47	—	—	4%	2 ,,
After 1863	—	—	—	—	124	—	—	18%	23 ,,
Rose (Fischer)	61	26·3%	(?)	6%	—	—	—	—	4 cures.
Billroth (Winiwarter)	143	23·7%	62%	5%	89	22%	68%	9%	8 cures.
Trendelenburg (Neuendorff)	97	11%	54%	2%	50	12%	68%	4%	2 cures.
Lücké (Dietrich)	110	7·6%	(?)	9%	69	8%	60%	13%	9 cures.
Czerny (Schmidt)	150	4·4%	(?)	5%	82	6%	46%	8·5%	8 cures.
Krönlein (Horner)	144	4%	58%	18%	121	4%	68%	20%	25 cures.
Küster (Schmidt)	222	10·8%	(?)	9%	132	14%	(?)	15%	20 cures.
König (Hildebrand)	135	—	—	17%	118	9%	61%	20%	23 cures.
Bergmann (Eichel)...	114	4·3%	62%	11%	43	7%	62%	30%	13 cures.
Mitchell Banks	82	12%	26·8	21·9	—	—	—	—	18 cures.
Halsted	50	0	43%	4% or 8%	11	0	54%	18-36%	2–4 cures.
Watson Cheyne	61	1·6%	32%	19·9%	21	0	42·8%	57%	12 cures.

Table III.

Operations for Malignant Disease of the Pharynx collected, as far as possible, up to the end of 1895.

Group I.—Cases where the disease was removed from the mouth, with or without splitting the cheek, and with or without tracheotomy, where in fact there was no wound in the neck communicating with the mouth.

α. *Carcinoma.*

No. of case.	Operator and reference, and year of operation.	Sex and age.	Disease and parts involved.	Nature of operation.	Immediate result.	Ultimate result.
1	Newman. (1890) "Malignant Diseases of Throat and Nose"	M 65	Epithelioma of left tonsil, uvula and posterior pillar of fauces, noticed 4 weeks. No glands	Removed through mouth with thermo-cautery under cocaïne	Recovered	Still remains well, 6 years later, therefore CURED. (Private communication.)
2	Wolff. (1889) 'Berl. Klin. Wochnschr.,' 1891, p. 401	M 45	Carcinoma of left tonsil and neighbouring part of velum and pharynx	Head dependent. Removed from mouth. Half soft palate removed, tumour cut round and peeled out with finger	Recovered	Well $1\frac{1}{4}$ years later.
3	Körte. (1885) Referred to by Wolff, as above	M 51	Carcinoma of left tonsil and soft palate	Removed with head dependent	Recovered	3 months later gland removed from right side of neck and 7 months later one from left side. Remained well till 6 years and 4 months after operation, when recurrence in glands above left clavicle. No local recurrence.

Group I—*continued.*

a. Carcinoma—continued.

No. of case.	Operator and reference, and year of operation.	Sex and age.	Disease and parts involved.	Nature of operation.	Immediate result.	Ultimate result.
4	McIntyre. (1891) 'Journal of Laryngology,' 1893	M 60	Epithelioma of left tonsil and lower part of anterior pillar of fauces	Removed with scissors through mouth	Recovered	No recurrence 21 months later.
5	Watson Cheyne. (1892)	M 52	Epithelioma of left anterior pillar of the fauces spreading on to tonsil and towards tongue	Clipped out	Recovered	Patient cannot be traced.
6	Newman. (1891) "Malignant Diseases of Throat and Nose"	M 51	Epithelioma of tonsil and soft palate. No glands	Tracheotomy, and five days later removal with electro-cautery through mouth	Recovered	Still remains well, therefore CURED (5 years). (Private communication.)
7	Lauenstein. 'Deutsche Med. Wochnschr.,' 1888	M 65	Carcinoma of soft palate and upper part of anterior pillar of fauces	Tracheotomy. Right cheek split, soft palate, and anterior pillar of fauces removed	Recovered. Cannula removed next day	No further history.
8	MacEwen. (1878) Quoted by Newman	M 55	Epithelioma of right tonsil, side of pharynx and tongue	Incision from angle of mouth to angle of lower jaw and tumour removed. No further details	Recovered	Well 12 years later. Cured.
9	Kendal Franks. 'Lancet,' 1884, vol. i	M 45	Ulcerating carcinoma of left tonsil, soft palate, and base of tongue, with enlarged glands	Cheek split. Tongue removed by galvano-cautery, and then soft palate and tonsil by thermo-cautery. Gland removed later	Hæmorrhage on 8th and 14th days. Death from exhaustion after two months. Recurrence in floor of mouth	
10	Kocher. (1886) 'Langenbeck's Archiv,' vol. 45	M 64	Carcinoma of the mucous membrane between the jaws, spreading on to soft palate, anterior pillar of fauces and side of tongue. No glands	Removal, after splitting cheek, without performing tracheotomy or dividing jaw	Recovered	Gland found and removed a fortnight later No further history.

11	Weeks. (1889) 'Trans. Amer. Surg. Assoc.,' 1892	M 70	Epithelioma (?) of side of tongue, fauces, and left tonsil	Cheek split and affected parts clipped out	Recovered	Died a year later. No cause given. (? Recurrence.)
12	Watson. (1894) 'New York Med. Journ.,' 1894	F 53	Epithelioma (?) of left tonsil and anterior pillar of fauces. Enlarged gland	Freely removed by cautery knife. (? Gland)	Recovered	Well three months later.
13	Velpeau. Quoted from Stappert's Thesis, "Das Carcinom der Tonsille," 1889	M 68	Epithelioma of tonsil and pharynx	Ligature laid round common carotid, mouth opened, soft palate split, and tumour got out	Died in 17 days of pyæmia.	

β. Sarcoma.

14	McIntyre. (1892) 'Journal of Laryngology,' 1893	F 58	Sarcoma of left tonsil, anterior and posterior pillars of fauces	Clipped out	Recovered	Recurrence in right tonsil 6 months later. No further operation.
15	Newman. (1884) "Malignant Diseases of the Throat and Nose"	F 57	Spindle-celled sarcoma of left tonsil. No glands	Tracheotomy; removed through mouth piecemeal	Recovered	Remained well 5 years; then developed round-celled sarcoma in right tonsil, and rapidly died.
16	Lediard. (1887) 'Lancet,' 1889	M 62	Lympho-sarcoma of right tonsil	Tracheotomy; tumour clipped out through mouth	Recovered	Nine months later glandular recurrence removed. Well a year later.
17	Michaux. 'Bull. de l'Acad. Med. Roy. de Belgique,' 1886-87 Quoted by Bosworth: "Diseases of Throat and Nose"	M 45	Tumour (? sarcoma) involving left half of soft palate, and extending to pharynx and nares. Observed for 4 months	Excised through mouth. Recurred in one month, and then cheek split and growth with part of hard palate removed	Recovered	Recurred in 2 months. Inoperable.
18	Conner. (1888) 'New York Med. Rec.,' 1889	M 40	Sarcoma of tonsil size of man's fist	Cheek split and tumour enucleated	Recovered	Recurred in 2 months, and died in 4 months after operation.
19	O'Hara. 'Australian Med. Journ.,' 1892	M ?	Sarcoma of left tonsil involving left half of soft palate and root of tongue. No glands	Tracheotomy. Cheek split and tonsil pulled out and clipped away. Surrounding tissue destroyed with thermo-cautery	Recovered	Remained well 4 years; then died, sarcoma of lung. No local recurrence.

Group I—*continued.*

β. Sarcoma—continued.

No. of case.	Operator and reference, and year of operation.	Sex and age.	Disease and parts involved.	Nature of operation.	Immediate result.	Ultimate result.
20	Barker. 'Path. Soc. Trans.' 1886	F 74	Lympho-sarcoma of right tonsil and gland	Removed gland. Cut around tonsil with thermo-cautery, and shelled it out. Removed nodule from tongue	Recovered	3 weeks later second nodule in tongue removed. Rapid recurrence in glands, and died 6 months after operation.
21	Croly. (1886) 'Journal of Laryngology,' 1887	M 17	Round-celled sarcoma of left tonsil involving soft palate. Gland enlarged	Growth excised through mouth and gland removed	Recovered	Rapid recurrence in palate and neck, and death in 6 months.
22	Watson Cheyne. (11/9/94) (*See* Lecture II)	M 42	Round-celled sarcoma of right tonsil, side of pharynx, soft palate, and lower part of naso-pharynx; glands	Glands removed and external carotid tied; cheek split and disease removed partly from inside and partly from outside	Recovered	Mass of glands removed 8 months later, and again in beginning of April, 1896. Well 16 months after first operation. No local recurrence. (Patient still well, May, 1896.)
23	Gardner. 'Australian Medical Journal,' 1892	M 62	Sarcoma of left tonsil, pillars of fauces, and up to soft palate: ulceration in central part	Laryngotomy. Pharynx plugged, cheek incised from angle of mouth to masseter. Growth cut away	Recovered	14 months later growth in axilla, but no local return.

Group II.—Cases of disease in the Pharynx where the internal wound communicated with an incision in the neck.

A.—Where the disease was situated in or in the vicinity of the tonsils, and extended thence to the neighbouring parts.

1.—Where the jaw was not divided. *a.*—No Tracheotomy.

a. Carcinoma.

No. of case.	Operator and reference, and year of operation.	Sex and age.	Disease and parts involved.	Nature of operation.	Immediate result.	Ultimate result.
24	Polaillon. 'Gazette Méd. de Paris,' 1885	M 37	Epithelioma of right tonsil, slightly on soft palate and base of tongue	Ligature of lingual and right common carotid. Incision from angle of mouth to wound. Lateral pharyngotomy. Removal by galvano-cautery and thermo-cautery of base of tongue, tonsil, &c.	Died. Bleeding 1½ months after operation, and common carotid tied. Death in a few hours. There was local recurrence. Paralysis followed ligature of common carotid.	
25	Polaillon. (1883) 'Gazette Méd. de Paris,' 1886	M 65	Epithelioma of left tonsil, spreading on to soft palate and base of tongue	Ligature of external carotid. Incision from angle of mouth to incision in neck. Removal by galvano- and thermo-cautery	Died. Hæmorrhage on 14th day, and again on 16th, from external carotid; latter fatal.	
26	Watson Cheyne. (13/10/94) (*See* Lecture II)	M 55	Epithelioma of left tonsil, anterior pillar of fauces, and soft palate, very large mass of glands extending under sterno-mastoid, and adherent to vessels	Removal of glands with internal jugular vein. Ligature of external carotid. Lateral pharyngotomy. Removal of mass, partly from inside and partly from outside	Recovered	Well 15 months later. (Still well, May, 1896.)
27	Kocher. (1881) 'Langenbeck's Archiv,' vol. 45	M 49	Carcinoma of right tonsil, soft palate, anterior pillar of fauces and side of tongue	Cheek split and tumour removed by external and internal incisions	Recovered	Recurred in a little over a year.

Group II. A.—*continued.*

1.—Where the jaw was not divided. *a*.—No Tracheotomy.

a. Carcinoma—continued.

No. of case.	Operator and reference, and year of operation.	Sex and age.	Disease and parts involved.	Nature of operation.	Immediate result.	Ultimate result.
28	Thorburn. (1889) 'Brit. Med. Journal,' 1890	? ?	Epithelioma of right tonsil, and soft palate, of both alveoli and base of tongue. Gland in neck	Removal by pharyngotomy	Recovered	Recurred in palate 6 weeks later. Removal. Well 2½ months later.
29	Fowler. 'Journal of Laryngology,' 1888	F 67	Carcinoma of left tonsil. Glands in neck	Tied lingual and facial arteries. Opened pharynx by cautery, and removed tonsil. Glands shaved off carotid	Recovered	Died, 8 months later, of gastric ulcer. Glandular recurrence in both parotid regions.

β. Sarcoma.

No. of case.	Operator and reference, and year of operation.	Sex and age.	Disease and parts involved.	Nature of operation.	Immediate result.	Ultimate result.
30	Wheeler. 'Dublin Journal,' 1884	F ?	Spindle-celled sarcoma in right sinus pyriformis starting from stylo-hyoid ligament	Lateral pharyngotomy. Removal of tumour piecemeal. No special arrangements for exposing the tumour	Recovered	Recurred locally in 3 months. Further attempt at removal failed. Death from exhaustion.
31	Cheever. 'Boston Medical and Surgical Journal,' 1869, p. 54	M 34	Sarcoma of tonsil (left), ulcerated. Glands enlarged	Incision along border of jaw. Removal of glands. Division of digastric, stylo-hyoid and stylo-glossus. Pharynx opened. Tumour removed	Recovered after 31 days.	
32	Homans. (1890) 'Lancet,' 1891, vol. 2	F 59	Round-celled sarcoma of right tonsil	Incision outside; tonsil clipped out from mouth	Recovered	Well 5 months later.
33	Raymond Johnson. (1892) 'Lancet,' 1893, vol. 1	F 53	Lympho sarcoma of tonsil and glands in neck	Glands removed from neck. Pharynx exposed from neck. Ligature of external carotid. Tonsil clipped out	Recovered	Recurrence in glands; removed a month later, and again 6 months later. No local recurrence.

34	Chavasse. (1892) 'Lancet,' 1893, vol. 1	? ?	Alveolar sarcoma of left tonsil; glands at angle of jaw. Thumb previously removed for sarcoma	Oblique incision from ear to hyoid bone, connected with one from angle of mouth	Recovered	No recurrence 14 months later.

b.—Tracheotomy.

a. Carcinoma.

35	Kocher. (1875) 'Deutsche Zeitschr. f. Chirurg.,' 1880	M 53	Carcinoma of left tonsil spreading on to soft palate and base of tongue; glands	Glands removed first. Eight weeks later, removal of primary mass, including common carotid, great cornu of hyoid bone, posterior part of tongue, soft palate, tonsil, and side of pharynx	Recurred immediately, and 4 weeks later second operation, followed by death from septic pneumonia	On 6th day, after first operation, embolism of left retinal artery.
36	Charters Symonds. 'British Medical Journal,' 1888	M 45	Epithelioma of anterior part of tonsil, extending on to floor of mouth, cheek, and gum. Submaxillary gland affected	Cheek split. Removal of tonsil, part of soft palate, pharynx and tongue, by clipping; gum peeled off	Recovered	Recurred in 3 months, and again excised with part of jaw. Second recurrence and operation. Third recurrence and death.
37	Küster. (?) (1884) From Meyer's Thesis, "Beiträge zur Statistik der Zungen Carcinome," 1888	M 50	Carcinoma of back of right side of tongue, spreading on to pharynx up to the neighbourhood of the inferior maxillary joint; glands	Gland removed. Cheek split. Removal of disease. Jaw not divided	Recovered	Died of recurrence 2½ months later.
38	Watson Cheyne. (12/6/95)	M 44	Epithelioma of right tonsil, base of tongue, floor of mouth, soft palate, and side of pharynx. Glands	Removal of glands and ligature of external carotid. Cheek split to masseter. Lateral pharyngotomy. Disease removed in one mass (part of tongue, tonsil, half soft palate, part of wall of pharynx)	Did well, and was able to be up and feed himself, when, on July 7th (25 days after the operation), there was a sudden hæmorrhage from the external carotid, which choked him before assistance could be obtained.	

Group II. A.—*continued.*

1.—Where the jaw was not divided. *b*.—Tracheotomy.

a. Carcinoma—continued.

No. of case.	Operator and reference, and year of operation.	Sex and age.	Disease and parts involved.	Nature of operation.	Immediate result.	Ultimate result.
39	Watson Cheyne. (1/7/95)	M 56	Epithelioma of tongue, tonsil, soft palate and side of pharynx on right side. Glands in neck	As in former case (38), but in addition the internal carotid was firmly involved in the growth, and as the patient was very collapsed it was left for 4 days and then removed	Went on well for 4 days, then removal of diseased internal carotid. That evening signs of septic pneumonia, and next day also of paralysis of left side, and death on sixth day	
40	Watson Cheyne. (23/7/95)	M 55	Epithelioma of the posterior part of the right half of the tongue, tonsil, half of soft palate, side of pharynx and glands in neck	Ligature of external carotid and removal of glands A week later tracheotomy, upper part of wound re-opened, and primary mass excised	After the second operation patient suffered from post-operative mania, and it was a most difficult thing to feed or do anything with him. Otherwise he went on well till 8th day, no fever, &c. On 11th day slight hæmorrhage, common carotid tied by a colleague. Two days later complete hemiplegia on opposite side and ultimately death on the 31st day after operation. Softening of right part of brain and abscess in lung	
41	Milligan. (1892) 'Journal of Laryngotomy,' 1893	M 49	Epithelioma of left tonsil, palatine arches, part of soft palate, and small piece of hard, posterior third of tongue. Glands	Incisions along jaw from symphysis and oblique one thence to sterno-mastoid. Parts removed	Died of hæmorrhage from common carotid on 27th day	

42	Dupage. (1895)	M 52	Cancer of lower part of pharynx and œsophagus	Subhyoid pharyngotomy and vertical incision. Pharynx divided above tumour and parts removed. Œsophagus sutured to skin	Recovered.	
43	Dupage. (1895)	M 53	Epithelioma on right side of upper part of pharynx	Tracheotomy, lateral pharyngotomy, removal of disease	Died on 10th day of post-operative mania	

2.—Where the jaw was divided. *a.*—No Tracheotomy.

a. Carcinoma.

44	Heinecke. (1877) From Kranefuss's Thesis, "Ueber einen Fall von Retropharyngealem Carcinom"	M 51	Carcinoma of tonsil, soft palate and side of pharynx	Removal of portion of lower jaw and of disease. Wound left open in middle	Healed after plastic operation	No further result given.
45	Albert. (1878) 'Wiener Med. Presse,' vol. 19	M 58	Carcinoma of lateral pharyngeal wall recurring after removal of parts through mouth with scissors	Division of jaw and removal of remains of tonsil and posterior pillar of fauces	Healed	No further result given.
46	Mikulicz. (1883) 'Deutsche Med. Wochnschr.,' 1886	F 65	Epithelioma of tonsil, pharynx, base of tongue, soft palate and glands	Lateral pharyngotomy and removal of ascending ramus of jaw from in front of angle	Recovery	Recurred within 2 years locally and inoperable. Bad functional result.
47	Mikulicz. (1883) 'Deutsche Med. Wochnschr.,' 1886	M 61	Carcinoma of tonsil, soft and hard palate	Same as above, but failed to entirely remove disease	Death in 2½ hours from collapse and blood in trachea.	
48	Polaillon. (1882) 'Gaz. Méd. de Paris,' 1886	M 43	Epithelioma of left tonsil spreading on to anterior pillar of fauces, soft palate and base of tongue. Glands in neck	Removal of glands and ligature of external carotid. Incision from angle of mouth to join vertical one. Tumour removed by galvano- and thermo-cautery	Recovery. Violent hæmorrhage on 10th and 11th days	Died of recurrence during the year.
49	Trendelenburg. (1888) From Stappert's Thesis, "Das Carcinom der Tonsille," 1889	M 37	Carcinoma of right tonsil reaching down to larynx, involving half of soft palate and base of tongue. Glands	Incision dividing middle of lower lip and along lower border of jaw to angle. Removal of disease including right half of tongue. No ligature of external carotid	Recovered and discharged in a month. Bleeding not severe	No further result.

Group II. A.—*continued.*

2.—Where the jaw was divided. *a.*—No Tracheotomy.

a. Carcinoma—continued.

No. of case.	Operator and reference, and year of operation.	Sex and age.	Disease and parts involved.	Nature of operation.	Immediate result.	Ultimate result.
50	Polaillon. (1884) 'Gaz. Méd. de Paris,' 1886	M 41	Carcinoma of half soft palate, tonsil, side of tongue and floor of mouth on left side. Glands	Ligature of external carotid. Incision from angle of jaw to the neck incision. Removal by galvano-cautery	Recovery. Hæmorrhage on next day, and on 3rd day very profuse. Stopped by plugging and ligature	Recurrence in 2 months, and death in 8 months.
51	Polaillon. (1885) 'Gaz. Méd. de Paris,' 1886	M 55	Epithelioma of left lower gum, floor of mouth and extending on to pharynx. Gland	Ligature of external carotid. Division of lower jaw and removal of mass by thermo-cautery	Hæmorrhage on 4th day and rapid death, probably from external carotid, the ligature being destroyed by the cautery.	
52	Polaillon. (1886) 'Gaz. Méd. de Paris,' 1886	M 70	Epithelioma of right tonsil, soft palate, pillars of fauces, and base of tongue	As above	Died, septic pneumonia, on 3rd day.	
53	Weinlechner. (1886) 'Aerztl. Ber. des k. k. Allgemein. Krank. zu Wien,' 1888, p. 208	M 60	Ulcerated tumour of right tonsil, soft palate and anterior pillar of fauces. (? Carcinoma)	Incision from angle of mouth, resection of jaw, &c.	Severe bleeding 3rd day. Ligature of common carotid, followed by hemiplegia in 3 hours, and death in 17 hours.	
54	Küster. (?) (1884) Meyer's Thesis, "Statistik der Zungen Carcinome," 1888	M 28	Carcinoma of base of left side of tongue, extending on to pharynx. Gland	Both linguals tied. Jaw sawn through and disease removed. Much blood lost and some entered trachea	Recovered	Recurred quickly, and patient died 11 months after operation.
55	Küster. (?) Meyer's Thesis	M 39	Carcinoma of base of left side of tongue, anterior pillar of fauces and epiglottis	Removal of more than half the tongue, half the epiglottis and hyoid bone, left tonsil, pillars of fauces, and left side of floor of mouth	Recovered	Recurred quickly, and died 9½ months after operation.

56	Rushton Parker. (1876) 'Med. Times and Gazette,' 1877, p. 590	M 58	Epithelioma of left side of tongue, lower jaw, and cheek	Cheek split, body of jaw removed, half the tongue, part of each jaw, submaxillary gland, side of pharynx and part of soft palate	Recovered	Recurred in glands, on right side. 6 years later, and subsequent death.
57	Rushton Parker. (1877) 'Med. Times and Gazette,' 1877, p. 590	M 54	Epithelioma of soft palate, fauces, gum, and floor of mouth	Cheek split and piece of jaw removed. Removal of half tongue, half of soft palate, side of pharynx and submaxillary glands	Recovered	Recurred in glands, attempt to remove them failed. Death 5½ months after operation.
58	Lange. 'New York Med. Journ.,' 1891	? ?	Epithelioma of left wall of pharynx, tonsil, soft palate, and submaxillary gland	Cheek split, and jaw divided near angle. Affected parts excised	Recovered	Swallows well. No further history.
59	Kocher. (1883) 'Langenbeck's Archiv f. Klin. Chirurg.,' vol. 45	M 49	Recurrence *in situ* after removal of carcinoma of right tonsil, &c. *See* Case 27	Extensive removal of affected parts	Recovered	No further history.
60	Kocher. (1885) 'Laugenbeck's Archiv f. Klin. Chirurg.,' vol. 45	M 57	Carcinoma of anterior pillar of fauces, soft palate, tonsil, side of pharynx, and base of tongue. Glands	Excision of diseased portion of jaw and affected parts	Recovered	No further history.
61	Barker. (1885) 'Lancet,' 1887	M 55	Epithelioma of tonsil and side of pharynx, slightly on hard and soft palates, on side of tongue, and on lower jaw behind molar	Cheek split, ascending ramus of jaw removed. Half soft palate, mucous membrane on hard; side of pharynx and part of tongue removed	Recovered	Recurred in six months, and died 3 months later.
62	Watson Cheyne. (Oct. 1895)	M 55	Recurrence *in situ* after removal of epithelioma of tonsil, palate, tongue, &c. *See* Case 84	Removal of ramus of jaw and internal pterygoid muscle, pterygoid plates, part of masseter and temporal muscles, scar tissue. Nitric acid applied to cut surfaces	Recovered. On the 9th day, nitric acid sloughs separating and hæmorrhage from internal carotid, which was tied above and below, without any bad result	Patient died of "inanition" at the end of February, 1896.
63	Dupage. (1894) 'Journal of Laryngology,' 1895	M 52	Epithelioma of right tonsil, soft palate, and lateral wall of pharynx. Many glands	Glands removed and external carotid tied. Pharynx exposed by Mikulicz's method, and affected parts removed	Recovered	Well 8 months later.

Group II. A.—*continued.*

2.—Where the jaw was divided. *a.*—No Tracheotomy.

β. Sarcoma.

No. of case.	Operator and reference, and year of operation.	Sex and age.	Disease and parts involved.	Nature of operation.	Immediate result.	Ultimate result.
64	Cheever. 'Philadelphia Med. News,' 1889	M 57	Round-celled sarcoma of left tonsil. Two glands in neck	Glands removed. Jaw sawn, and tumour taken away	Recovered	Recurred in glands in anterior triangle. Removed. No further report.
65	Trendelenburg. (1882) Jardon's Thesis, "Ueber Tonsillengeschwülste," 1883	M 49	Malignant lymphoma of right tonsil extending into soft palate and on to wall of pharynx. Large mass in neck at angle of jaw	Removal by lateral pharyngotomy and division of jaw	Recovered	Recurrence locally 6 months later, and also nodules over the body.
66	Weeks. (1891) 'Trans. American Surgical Assoc.,' 1892	M 57	Very large ulcerated left tonsil (? sarcoma) filling fauces. Glandular masses in neck	Glands removed, jaw divided, tonsil removed	Recovered	Well a year later.
67	V. Winiwarter. 'Archiv f. Klin. Chirurg.,' vol. 18	M 62	Malignant lymphoma of right tonsil pushing aside uvula, extending on to angle of lower jaw and side of pharynx. Mass in anterior triangle	Removed after resection of the jaw	Died on 2nd day.	
68	Genzmer. 'Deutsche Gesellschaft f. Chirurg.,' 1879, vol. 8	M ?	Sarcoma of tonsil	Division of jaw. Removal of tonsil, part of soft palate, whole of right, and half posterior pharyngeal wall	Recovered	Well $2\frac{3}{4}$ years later.

b.—Tracheotomy.

a. Carcinoma.

69	Bergmann. (1883) 'Deutsche Med. Wochnschr.,' 1883	F 62	Carcinoma of tongue, tonsil, and side of pharynx; right side. Glands	Removal of tongue (only a very small piece left on left side), piece of jaw, floor of mouth side of pharynx, submaxillary glands, and lymphatic glands. Plastic 3 weeks later	Recovered	Well 107 days after operation.
70	Mikulicz. 'Deutsche Med. Wochnschr.,' 1886	M 42	Carcinoma of whole side of pharynx and half soft palate, going high up to base of skull. Glands	Removal of ascending ramus of jaw. Failure to remove the upper part of growth	Recovered. Went out in 6 weeks	Continued growth.
71	Mikulicz. (1894) 'Langenbeck's Archiv f. Klin. Chirurg.,' 1895	M 55	Carcinoma of right tonsil, spreading on to soft palate down to base of tongue, reaching upper jaw, and upwards into post nasal space. No glands	Incision along anterior border of sterno-mastoid, and then from angle of mouth to middle of this. Ramus of jaw removed behind. Tumour removed	Recovered	No further history.
72	Helferich. (1890) Barthauer's Thesis, "Ueber Malignen Pharynxtumoren," 1891	F 61	Epithelioma on left side of pharynx, soft palate spreading on to hard palate, tonsil, pillars of fauces, side of pharynx as low as larynx, and on to tongue	Tracheotomy. Subhyoid pharyngotomy; cheek split from angle of mouth to other incision, jaw divided, and ramus removed. Tumour taken away, also piece of hard palate. Tumour reached up to base of skull, and was there peeled off, and the surface cauterized with thermo-cautery	Died, on 6th day, of septic pneumonia.	
73	Küster. (1884) 'Deutsche Med. Wochnschr.,' 1885	M 61	Epithelioma of left tonsil, soft palate, pharynx and tongue, and mucous membrane over angle of jaw up to upper jaw. Glands	Incision from angle of mouth to sterno-mastoid. Jaw sawn in front of masseter. Posterior part disarticulated. Growth removed	Died, on 7th day, of septic pneumonia and mediastinitis.	
74	Küster. (1885) 'Deutsche Med. Wochnschr.,' 1885	M 49	Epithelioma of left tonsil and side of pharynx on to side of tongue, and soft palate to near uvula	Jaw sawn through as in 73, and ramus removed. Removal of growth. No glands removed	Recovered. Functional result good	Recurred in lymphatic glands. Removal 5 months later. No further history.

Group II. A.—*continued.*

2.—Where the jaw was divided. *b.*—Tracheotomy.

a. Carcinoma—continued.

No. of case.	Operator and reference, and year of operation.	Sex and age.	Disease and parts involved.	Nature of operation.	Immediate result.	Ultimate result.
75	Kocher. (1879) 'Deutsch. Zeitschr. f. Chirurg.,' 1880	M 45	Excision of tongue in May of same year. In October, recurrence over lower jaw in front of masseter, from this an ulcerated mass down to hyoid bone, inside of cheek, on to soft palate, tonsil, and whole side of pharynx up to naso-pharynx	Angular incision laying bare side of jaw and neck. Branches of carotid and jugular tied. Left half of lower jaw removed, and all the growth and remains of tongue	Recovered	Recurrence 9 weeks later. Inoperable.
76	Kocher. (1876) 'Deutsch. Zeitschr. f. Chirurg.,' 1880	M 53	Carcinoma on left side of tongue (ulcerated) extending on to fold between the jaws, up to the tonsils, and on to soft palate as far as uvula	Jaw divided at anterior border of masseter. Incision along anterior border of sterno-mastoid and along jaw. Wound left open. Tracheotomy tube left in 5 days	Recovered. Still small fistula. Nonunion of jaw	9 months later, removal of glands. Well 3 years later.
77	Kocher. (1875) 'Deutsch. Zeitschr. f. Chirurg.,' 1880	M 52	In May, removal of whole left half of tongue. Recurrence in January, adherent to jaw, reaching to hyoid bone and in stump of tongue	Removal of piece of jaw, tumour, great cornu of hyoid bone and stump of tongue	Recovered	Died of recurrence a year later.
78	Kocher. (1876) 'Deutsch. Zeitschr. f. Chirurg.,' 1880	M 56	Epitheliomatous ulcer of base of left side of tongue, extending on to side of pharynx, and up to hard palate. Glands	Jaw divided in front of masseter and posterior part removed. Disease cut away	Died on 5th day from septic pneumonia.	

79	Kocher. (1881) 'Langenbeck's Archiv f. Klin. Chirurg.,' vol. 45	M 23	Carcinoma of left side of tongue, anterior pillar of fauces, tonsil and pharynx	Division of jaw and removal of disease	Died after 36 hours of septic pleurisy.	
80	Braem. (1894) 'Langenbeck's Archiv f. Klin. Chirurg.,' 1895	M 58	Carcinoma of left tonsil and side of pharynx, extending on to mucous membrane between the jaws and over angle of lower jaw and posterior pillar of fauces, soft palate to border of hard and down close to base of tongue. Glands	Incision along anterior border of sterno-mastoid. Glands removed. Then from angle of mouth to middle of this. Jaw removed from in front of masseter. Mass removed. Trendelenburg cannula left for 24 hours, and ordinary cannula for 7 days	Recovered	No recurrence 6 months later. Functional result good.
81	Albert. 'Wiener Med. Presse,' vol. 19	M 27	Recurrence after removal of carcinoma of right upper jaw and extension to pharynx; affecting pharynx, lower jaw, cicatrix of upper, &c.	Removal of tissue replacing right upper jaw and part of left, the right side of the pharynx, almost all the right side of the lower jaw and glands	Recovered (?)	Further recurrence, and death soon afterwards.
82	Dupage. (1895) 'Journal of Laryngology,' 1895	M 53	Carcinoma of both tonsils and all posterior wall of pharynx	External carotid tied, Mikulicz's method; whole pharynx and epiglottis removed	Recovered in spite of pneumonia, diarrhœa, cystitis, &c.	Well 4 months after operation.
83	Lack. (1895) Not published	M 54	Epithelioma of left tonsil, soft palate, slightly on to hard, and slightly on to lateral wall of pharynx, on to lower jaw and adjoining part of cheek. Glands in neck	Glands removed, external carotid tied, incision along sterno-mastoid and thence along lower border of jaw. Flap raised, jaw divided close to second molar and ramus excised. Pharynx opened and mass clipped out	Went on well for 3 weeks and parts looked well. Died suddenly, cause not discovered. (?Septicæmia.)	
84	Watson Cheyne. (26/7/95)	M 55	Epithelioma of tongue, tonsil, soft palate, side of pharynx, gum of lower jaw at back and glands in neck on left side	Removal of glands and ligature of external carotid. A week later tracheotomy, division of jaw and removal of affected portion with half the tongue, the tonsil, half the soft palate, &c.	Recovered	Recurred 2½ months later locally. *See* No. 62.

Group II. A.—*continued.*

2.—Where the jaw was divided. *b.*—Tracheotomy.

β. Sarcoma.

No. of case.	Operator and reference, and year of operation.	Sex and age.	Disease and parts involved.	Nature of operation.	Immediate result.	Ultimate result.
85	Mikulicz. 'Deutsche Med. Wochnschr.,' 1886	M 28	Sarcoma of tonsil spreading on to pharynx, almost filling it up, and up to choanæ	Mikulicz's operation. Tracheotomy	Healed	Died, 3 months later, suddenly. Cause not known.
86	Obalinski. 'Centralblatt f. Chirurgie,' vol. 14	M 49	Sarcoma of right side of pharynx and tonsil, involving pillars of fauces and soft palate. Glands	Removal of glands. Resection of jaw. Removal of tumour	Recovered in 5 weeks. Function good	No further note.
87	Kümell. 'Deutsche Med. Wochnschr.,' 1888	M 28	Sarcoma of right tonsil, pillars of fauces, and part of pharynx, developing after removal of a large sarcomatous mass from the neck	Lateral pharyngotomy. Jaw sawn through. Cheek split	Recovered. Tracheotomy tube removed on 4th day	No further note.
88	Czerny. (1877) 'Beiträge zur Operativ. Chirurg.,' 1878, p. 64	M 34	Lympho-sarcoma of left tonsil, soft palate. Wall of pharynx ulcerated. Mass felt at angle of jaw	Division of jaw. Removal of tumour. Suspicious part left in pharyngo-palatine fossa	Recovered	Recurred, and second operation 2½ months after first. Died on 7th day of hæmorrhage from lingual artery.
89	Macleod. (1880) 'Glasgow Med. Journ.,' 1880	F 53	Round-celled sarcoma of palate and side of pharynx	Jaw split at symphysis. Tumour shelled out with fingers	Died 2nd day. Lung trouble.	
90	Cheevers. (1878) 'Boston Med. and Surg. News,' 1878	M 37	Tumour (sarcoma?) of right tonsil passing middle line, and growing rapidly. Glands	Glands removed. Jaw divided, and tonsil enucleated with fingers	Recovered	Local recurrence in a month cauterized. Further recurrence and death.
91	Roswell Park. (1878) 'Medical Record,' 1893	M 58	Round-celled sarcoma of left tonsil, and soft palate, ulcerated. Glands	Glands removed. Jaw divided. Gland and tumour removed	Recovered	Well 2½ years later.

92	Roswell Park. (1891) 'Medical Record,' 1893	M 31	Sarcoma (?) of right tonsil extending into and blocking naso-pharynx. Glands on both sides of neck	Jaw divided. Common carotid and internal jugular tied	Died 4 days later.	
93	Lanphear. (1894) 'New York Med. Journ.,' 1895	? ?	Sarcoma of right tonsil recurring rapidly after simple removal, filling up pharynx. Mass in neck. Facial paralysis	Tracheotomy. 3 days later division of jaw, external carotid tied, and mass in neck and mouth removed. Internal carotid wounded and tied	Died, 3 days later, hemiplegia. Never recovered consciousness.	

B.—Where the pharyngeal disease was at a lower level than the tonsillar region, or at any rate did not involve it.

a. Cacrinoma.

94	Heineke. (1878) Kranefuss's Thesis	M 54	Medullary carcinoma of posterior wall of pharynx	Division of jaw. Removal of mass	Death in 4 weeks—pneumonia.	
95	v. Bergmann. From Iversen	M 58	Cancer of lower part of pharynx and upper part of œsophagus	Removed	Died, 5 days later, from suppuration in neck, and mediastinitis.	
96	Israël. 'Berl. Klin. Woch.,' 1883	M 64	Cancer in left side and anterior wall of pharynx	Tracheotomy 3 days previously. Oblique incision. Subhyoid pharyngotomy, and tumour removed easily	Died, 7 days later, from suppuration between trachea and œsophagus, and septic pneumonia.	
97	Iversen. 'Langenbeck's Archiv f. Klin. Chirurg.,' vol. 31	F 34	Epithelioma of posterior wall of pharynx, extending slightly on to left wall	Tracheotomy. Subhyoid pharyngotomy	Recovered	Recurred, and 5 months after operation, tracheotomy and gastrostomy. Died a month later.
98	Iversen. 'Langenbeck's Archiv f. Klin. Chirurg.,' vol. 31	F 51	Epithelioma of posterior wall of pharynx at level of entrance of larynx	Tracheotomy. Subhyoid pharyngotomy	Recovered	Recurred 6 months later. Inoperable.
99	Iversen. 'Langenbeck's Archiv f. Klin. Chirurg.,' vol. 31	F 48	Epithelioma of posterior wall of pharynx and œsophagus	Tracheotomy. Subhyoid pharyngotomy	Recovered	Recurred 4 months later.

Group II. B.—*continued.*

a. Carcinoma—continued.

No. of case.	Operator and reference, and year of operation.	Sex and age.	Disease and parts involved.	Nature of operation.	Immediate result.	Ultimate result.
100	Cramer. (1889) 'Berl. Klin. Wochnschr.,' 1890, p. 987	M 57	Carcinoma of posterior wall of pharynx	Tracheotomy and, 2 days later, subhyoid pharyngotomy	Recovered	Died of phthisis 9 months later. No recurrence.
101	Woods. 'Medical Press and Circular,' 1893	F 44	Epithelioma of posterior wall of pharynx just above right arytenoid cartilage	Tracheotomy. Subhyoid pharyngotomy and growth removed. Much blood swallowed; removed by stomach tube	Recovered	No further history.
102	Verneuil. (1886) From Kranefuss's Thesis	? ?	Carcinoma of pharynx ...	Langenbeck's incision, with resection of jaw	Death, in 4 weeks, of septic pneumonia.	

β. Sarcoma.

No. of case.	Operator and reference, and year of operation.	Sex and age.	Disease and parts involved.	Nature of operation.	Immediate result.	Ultimate result.
103	v. Bardeleben. 'Schmidt's Jahrbuch,' 1885 vol. 207	F 40	Retropharyngeal fibro-sarcoma	Lateral pharyngotomy. Incision along border of sterno-mastoid	Recovered after membranous pharyngitis and laryngitis. Sent out at end of 7 weeks	(?)
104	Verneuil. 'Progres Med.,' 1884	F 57	Sarcoma of subhyoid region reaching to left parotid region	Tracheotomy. Removal of tumour and diseased part of hyoid bone	Died of collapse. Secondary nodules found in lungs and mediastinal glands.	
105	Baum. (1875) 'Berlin Klin. Wochnschr.,' 1875. Reported by Rosenbach	M 45	Round-celled sarcoma about size of hen's egg in pharynx chiefly on right side	Tracheotomy on admission for dyspœna. Pharynx opened, tumour peeled off, and base ligatured and removed	Recovered	Recurred later. Operated on by König.
106	Langenbeck. (1873) 'Archiv f. Klin. Chirurg.,' vol. 15. Quoted from Kranefuss's Thesis	F 22	Small celled sarcoma of pharynx	Tracheotomy. Resection of jaw. Failure to remove disease	Death, on 5th day, from septic pneumonia.	

107	v. Bergmann. (1883) 'Deutsche Med. Wochnschr.,' 1883	F 18	Spindle-celled sarcoma of left great cornu of hyoid bone involving wall of pharynx; ulcerated	Division of jaw. Formation of fistula. Tracheotomy. Pharyngotomia lateralis after v. Langenbeck. Removal of piece of great cornu	Recovered	Well 5 weeks after operation.
108	Lange. 'New York Med. Journ.,' vol. 45	M ?	Sarcoma of left half of pharynx behind palate and down so far as to dislocate larynx	Tracheotomy. Ramus of jaw removed and disease scraped out	Recovered	Well 7 months later. (? Simple tumour.)

C.—Where the epiglottis was the centre of the disease.

α. *Carcinoma.*

109	v. Langenbeck. Keitel's Thesis, "Operationen am Pharynx und Œsophagus," 1883	M 51	Carcinoma of epiglottis, &c.	Tracheotomy. Subhyoid pharyngotomy and epiglottis removed	Died 3rd day. Double pleurisy pericarditis and mediastinitis. Some growth seen on hyoid bone and arytenoids.	
110	Israël. (1893) 'Langenbeck's Archiv f. Klin. Chirurg.,' 1895	M 64	Epithelioma of whole epiglottis and right glosso-epiglottic ligament, and in fossa between tongue and epiglottis. No glands	Tracheotomy 3 days previously. Incision along lower border of hyoid bone, and all muscles, &c., divided, except thyro-hyoids. Superior laryngeal nerves preserved. Divided thyro-hyoid ligament close to hyoid, and glosso-epiglottic folds. Epiglottis removed. Mucous membrane of tongue stitched back to divided part. Cannula changed second day, and Hahn changed for ordinary tube on third	Recovered	Four months later, glands removed from both sides of neck. Well 2 years later.
111	Von Schulten. 'VirchowHirschJahrbuch,' 1882, II., p. 368	M 54	Epithelioma of epiglottis ...	Tracheotomy, followed by bronchitis. Four weeks later subhyoid pharyngotomy (Malgaigne) and removal of greater part of epiglottis	Recovered	No recurrence after 5 months. Eight weeks after operation could swallow well, but had to wear cannula.

Group II. C.—*continued.*

α. *Carcinoma*—continued.

No. of case.	Operator and reference, and year of operation.	Sex and age.	Disease and parts involved.	Nature of operation.	Immediate result.	Ultimate result.
112	Watson Cheyne. (23/11/94)	M 60	Epithelioma of base of tongue and epiglottis chiefly on left side. Glands in anterior triangle	Tracheotomy. Removal of glands. Ligature of external carotid. Lateral pharyngotomy, removal of whole epiglottis and base of tongue	Recovered	Glands removed from left posterior triangle, July, 1895, and from right anterior triangle, December, 1895. Well 15 months after operation. Excellent functional result. (Patient still well, May, 1896.)

β. *Sarcoma.*

113	Burow. 'Berl. Klin. Wochnschr.,' 1877	M 30	Sarcoma of epiglottis removed with snare 1874. Four months later recurrence, forming ulcerated tumour in site of epiglottis obstructing respiration. No glands	Tracheotomy for dyspnœa. Six days later, removal by snare, but part left. Ten days later, subhyoid pharyngotomy part cut off and rest scraped	Recovered	Well 1½ years later.
114	Albert. (1877) 'Wiener Med. Presse,' vol. 19	F 64	Sarcoma of left arytenoid extending on to epiglottis	No tracheotomy. Subhyoid pharyngotomy and removal of arytenoid and affected part of epiglottis	Recovered	Well a year later.

Group III.—Cases where the disease involved both Pharynx and Larynx.

a. Carcinoma.

No. of case.	Operator and reference, and year of operation.	Sex and age.	Disease and parts involved.	Nature of operation.	Immediate result.	Ultimate result.
115	v. Langenbeck. (1878) 'Archiv f. Klin. Chirurg.,' vol. 24	M 48	Carcinoma of right side of pharynx, involving right half of thyroid cartilage, right ary-epiglottic fold, and tip of arytenoid cartilage; glands	Tracheotomy. Pharynx opened from side. Tumour and part of thyroid cartilage and arytenoid removed. Superior laryngeal nerve divided	Death, 3 days later, of septic pneumonia.	
116	v. Langenbeck. (1878) 'Archiv f. Klin. Chirurg.,' vol. 24	M 78	Epithelioma of posterior wall of pharynx, coming on to lower part of thyroid cartilage	Lateral pharyngotomy. Removal of pharynx and upper part of œsophagus, piece of thyroid cartilage, and half thyroid gland	Death, a few hours after operation, from collapse.	
117	v. Langenbeck. 'Archiv f. Klin. Chirurg.,' 1879	F 52	Carcinoma of right half of pharynx and right arytenoid cartilage	Tracheotomy and lateral pharyngotomy. Removal of affected part of pharynx, right arytenoid cartilage, and posterior part of right vocal cord	Died, in 13 days, of septic pneumonia.	
118	Thiersch. From Iversen's paper, 'Archiv f. Klin. Chirurg.,' vol. 31	F 45	Carcinoma of pharynx at lower part and all round œsophagus and affecting larynx	Resection of pharynx, œsophagus, and larynx	Recovered	Died, 4 months later, of local recurrence.
119	Thiersch. From Iversen	F 57	Carcinoma of pharynx spreading on to both arytenoid cartilages, down to œsophagus, and involving thyroid gland	Removal of pharynx, larynx, and œsophagus to $2\frac{1}{2}$ cm. below manubrium sterni	Death, 7 days later, from septic pneumonia.	

GROUP III. *a. Carcinoma*—continued.

No. of case.	Operator and reference, and year of operation.	Sex and age.	Disease and parts involved.	Nature of operation.	Immediate result.	Ultimate result.
120	Iversen. 'Archiv f. Klin. Chirurg., vol. 31	F 44	Epithelioma surrounding lower part of pharynx and entrance of œsophagus, affecting posterior part of larynx	Tracheotomy. Subhyoid pharyngotomy. Removal of larynx and upper part of œsophagus	Recovered	No recurrence after 11 months. Functional result good, but contraction at entrance of œsophagus so great that introduction of œsophageal tube blocked trachea. Attempt to remedy this led to patient's death in 8 days from septicæmia.
121	Iversen. 'Archiv f. Klin. Chirurg.,' vol. 31	F 48	Carcinoma of pharynx and œsophagus, paralysis of vocal cords and affection of larynx	Tracheotomy. Removal of larynx, pharynx, and upper part of œsophagus	Recovered	Well 5 months later.
122	Iversen. 'Journal of Laryngology,' 1888	F 49	Epithelioma of lower part of pharynx and upper part of œsophagus	Excision of larynx, pharynx, upper part of œsophagus, and left lobe of thyroid	Died on 37th day of bronchopneumonia and abscess in lung.	
123	Iversen. 'Journal of Laryngology'	F 27	Epithelioma of posterior surface of cricoid, lower part of pharynx and upper part of œsophagus	Removal of larynx, pharynx, upper part of œsophagus, and right lobe of thyroid	Died, 30 hours later, of collapse.	
124	Iversen. 'Journal of Laryngology'	F 46	Epithelioma of right arytenoid and ary-epiglottic fold, and of pharynx down to œsophagus	Removed incompletely ...	Died, 8th day. (? Iodoform ? septicæmia.)	
125	Iversen. 'Journal of Laryngology'	F 34	Epithelioma of epiglottis extending down to lower part of pharynx	Removal of pharynx, larynx, epiglottis, and left lobe of thyroid	Recovered	Well 14 months later.

126	Marcacci. From Bosworth's "Diseases of the Throat and Nose"	F 20	Epithelioma of lower part of pharynx and upper part of œsophagus. Larynx also involved	Subhyoid pharyngotomy (?)	Death in 4 days.	
127	Watson Cheyne. (1/8/92) (*See* paper)	M 40	Epithelioma of right side of pharynx, right ary-epiglottic fold and epiglottis. Mass adherent to thyroid cartilage	Tracheotomy. Lateral pharyngotomy. Removal of disease and half the epiglottis. Rest of larynx left intact. Rest of epiglottis removed next day	Died, of septic pneumonia, on 4th day.	
128	McLeod. (1891) 'Indian Med. Gazette,' 1891	M 38	Malignant disease of left half of larynx, epiglottis, and arytenoids. Glands	Extirpation of whole larynx, anterior wall of pharynx, and glands	Recovered	No further history.
129	Lack. (1894) Not published	F 54	Epithelioma of right arytenoid and adjacent parts	Tracheotomy, lateral pharyngotomy, and excision of affected parts	Died, on 8th day, of exhaustion partly due to hæmorrhage.	
130	Bull. (1888) 'Med. Record,' 1895	M 51	Epithelioma of right side of larynx, epiglottis, and neighbourhood. Glands	Tracheotomy. 11 days later removal of half the larynx, epiglottis, and part of pharynx	Recovered	Died of recurrence in 14 months.
131	Stimson. (1892) 'Med. Record,' 1895	M 36	Carcinoma of larynx and œsophagus	Removal of part of larynx and œsophagus	Died in 36 hours.	
132	Branham. (1887) 'Med. Record,' 1895	M ?	Carcinoma (?)	Removal of larynx and pharynx	Died, on 4th day, of pneumonia.	
133	Roux. (1887) 'Med. Record,' 1895	F 61	Carcinoma (?)	Removal of larynx, pharynx, and glands	Recovered	Recurred in 4 months.
134	Billroth. (1879) 'Archiv f. Klin. Chirurg.,' vol. 31	F 43	Carcinoma of larynx and pharynx	Removal of whole larynx, thyroid gland, and part of pharynx	Died, 5 weeks later, from œsophageal tube passing into mediastinum.	
135	MacEwen. (1879) Tauber 26 in 'Archiv f. Klin. Chirurg.,' vol. 41	M 56	Carcinoma of larynx and pharynx. Glands	Removal of whole larynx, upper part of pharynx, and glands	Died, on 3rd day, of pneumonia.	
136	Bircher. (1880) Tauber, 41	F 49	Scirrhus of thyroid gland and larynx. Partial laryngectomy, and recurrence in 6 months	Removal of whole larynx and part of pharynx	Died, 16th day, of pneumonia and gangrene of lung.	

Group III. *a. Carcinoma*—continued.

No. of case.	Operator and reference, and year of operation.	Sex and age.	Disease and parts involved.	Nature of operation.	Immediate result.	Ultimate result.
137	Albert. (1881) Tauber, 54	M 45	Carcinoma of larynx, filling up nearly half the lumen	Removal of whole larynx, except epiglottis and part of œsophagus	Died, 8th day, bleeding from internal carotid ligature; collapse.	
138	Margary. (1881) Tauber, 56	F 36	Epithelioma, larynx and œsophagus	Removal of whole larynx and first tracheal ring, part of pharynx and œsophagus	Recovered	Recurred in 3 months, and died of bleeding in 6 months.
139	Reyher. (1882) Tauber, 64	M 55	Carcinoma, larynx and pharynx	Removal of whole larynx and part of œsophagus	Died, 14th day, of inanition.	
140	Holmer. (1882) Tauber, 69	M 63	Epithelioma of larynx and pharynx	Removal of whole larynx and part of pharynx	Died, 4th day.	
141	Von Winiwarter. (1882) Tauber, 76	M 50	Carcinoma of larynx, pharynx, and glands	Removal of whole larynx, part of pharynx and glands, with internal jugular vein	Died, 9th week, inanition.	
142	Novaro. (1883) Tauber, 87	M 54	Carcinoma of larynx, pharynx, and thyroid gland	Removal of whole larynx, thyroid gland, and part of pharynx	Died, 1 month, croupous pneumonia.	
143	Thos. Jones. (1884) Tauber, 94	M 44	Epithelioma of larynx and pharynx	Removal of whole larynx, part of pharynx, and first tracheal ring	Recovered	Recurred in lymphatic glands.
144	Hahn. (1884) Tauber, 101	F 52	Carcinoma of œsophagus and larynx	Removal of whole larynx, anterior wall of pharynx, and œsophagus	Recovery	Rapid recurrence and death in 2 or 3 months.
145	Jawdynsky. (1885) Tauber, 112	F 63	Carcinoma, larynx and pharynx	Removal of whole larynx and part of pharynx	Recovery	Died of recurrence in 10 months.

146	Pèan. (1886) Tauber, 119	M 65	Epithelioma, larynx and pharynx	Removal of whole larynx, part of epiglottis, and anterior wall of pharynx	Died, pneumonia.	
147	Pèan. (1894) 'Archiv Internat.deLaryngol.', 1895	M 50	Epithelioma of larynx, epiglottis, pharynx, œsophagus and trachea	Tracheotomy. Removal of whole larynx, part of pharynx, and œsophagus	Recovered	Well 2 months later.
148	Dupont. (1886) Tauber, 127	M 52	Carcinoma of larynx, epiglottis, and glands	Removal of whole larynx, epiglottis, and part of œsophagus	Recovered	Died 14 months later. (? Cause.)
149	Agnew. Tauber, 134	M 58	Carcinoma of larynx and glands	Removal of whole larynx, and part of anterior wall of pharynx	Died, 3rd day.	
150	Rushton Parker. (1887) Tauber, 147	M 39	Carcinoma of larynx and pharynx recurring after two previous partial operations	Total extirpation of larynx, part of pharynx and tonsils	Recovered	Recurred in 9 weeks, followed by death.
151	Kocher. (1882) 'Langenbeck's Archiv,' vol. 44	M 54	Carcinoma left ventricular band, arytenoid, ary-epiglottic fold, left side of pharynx and glands	Total extirpation of larynx, part of pharynx and glands	Recovered	No recurrence in 4 months. Died in 14 months, cause unknown.
152	Kocher. (1882) 'Langenbeck's Archiv,' vol. 44	M 43	Carcinoma, larynx and pharynx	Total extirpation of larynx, and part of œsophagus	Recovered	Recurred in 6 months.
153	Kocher. (1889) 'Langenbeck's Archiv,' vol. 44	M 53	Epithelioma, larynx and glands, &c.	Total extirpation of larynx, resection of pharynx and œsophagus	Died, 5th day, collapse and accumulation of mucus.	
154	Kocher. (1890) 'Langenbeck's Archiv,' vol. 44	M 58	Diffuse growth upper part of larynx, tongue, and glands	Bemoval of tongue, floor of mouth, hyoid bone, part of pharynx, thyroid cartilage, and lower jaw	Recovered	Recurrence in 11 months.
155	v. Langenbeck. (1875) No. 8 in Wassermann's Statistics, 'Deutsche Zeit. f. Chirurgie,' 1889	M 57	Carcinoma of larynx, epiglottis, and hyoid bone	Removal of the whole larynx, epiglottis, part of tongue, pharynx, and œsophagus	Recovered	Died of recurrence 4 months after operation.
156	Bottini. (1877) No. 15, Wassermann	M 48	Epithelioma of larynx, &c....	Total extirpation of larynx, and part of œsophagus	Died, 3 days later, pneumonia.	

Group III. *a. Carcinoma*—continued.

No. of case.	Operator and reference, and year of operation.	Sex and age.	Disease and parts involved.	Nature of operation.	Immediate result.	Ultimate result.
157	Thiersch. (1880) Wassermann	M 36	Carcinoma of larynx, &c. ...	Total extirpation of larynx, and part of œsophagus	Recovered	Died, 3½ years later, of recurrence.
158	McLeod (Calcutta). (1883) Wassermann	M 40	Epithelioma of larynx, &c....	Total extirpation of larynx, epiglottis, part of pharynx, and glands	Died, 5th day, hæmorrhage, commencing pneumonia.	
159	Landerer. (1883) Wassermann	M 47	Carcinoma of larynx and pharynx	Total extirpation of larynx and left side of œsophagus	Died, 4th day, collapse.	
160	Krönlein. (1886) Wassermann	F 38	Carcinoma of larynx, &c. ...	Total extirpation of larynx, and part of the œsophagus	Recovered	Died, 13 months later, of recurrence.
161	Novaro. (1887) Wassermann	M 72	Carcinoma of pharynx and larynx	Total extirpation of larynx, and part of pharynx	Recovered	Died of recurrence 9 months later.
162	Riegner. (1888) Wassermann	M 60	Carcinoma of larynx, &c. ...	Total extirpation of larynx, and part of trachea and œsophagus	Died, 4 weeks later, pneumonia.	
163	Billroth. (1881) Wassermann	M 65	Carcinoma of larynx, &c. ...	Removal of right half of larynx and part of pharynx	Died, 6 weeks later, of Sepsis, recurrence.	
164	Billroth. (1884) Wassermann	M 58	Carcinoma of larynx and pharynx	Removal of right half of larynx, part of pharynx, glands, and greater part of epiglottis	... ...	Recurrence 2 months later.
165	Billroth. (1884) Wassermann	M 46	Carcinoma of larynx and pharynx	Removal of right half of larynx, part of pharynx, epiglottis, and glands	Recovered.	
166	Socin. (1887) Wassermann	F 55	Epithelioma of larynx ...	Removal of right half of larynx, epiglottis, half the hyoid bone, and part of the pharynx	Recovered	No recurrence 10 months later.

167	Demous. (1887) Wassermann	M 44	Epithelioma of epiglottis and tongue	Removal of the upper two-thirds of thyroid cartilage, part of the pharynx and tongue	Recovered	Recurrence 9 months later.
168	Krönlein. (1887) Wassermann	M ?	Carcinoma of larynx... ..	Removal of half the larynx, part of epiglottis, and pharynx	Died, 17 days later, of pneumonia.	
169	Küster. (1888) Wassermann	M 52	Carcinoma of larynx. Glands	Removal of right half of larynx and part of pharynx	Died, 19th day, putrid bronchitis.	

β. Sarcoma.

170	Caselli. (1879) Tauber 27 in 'Archiv f. Klin. Chirurg.,' vol. 41	F 19	Sarcoma of pharynx, larynx, and base of tongue	Removal of whole larynx, upper part of pharynx, and glands	Died, on 3rd day of pneumonia.	
171	Lange. (1879) Tauber, 28	M 74	Sarcoma of larynx and part of pharynx	Removal of whole larynx, right cornu of hyoid, and part of œsophagus	Recovered	Died of recurrence 7 months later.
172	MacLeod. (1883) Tauber, 86	M 54	Sarcoma of pharynx, larynx, &c.	Removal of whole larynx, part of pharynx, thyroid, and lymphatic glands	Died on 5th day of hæmorrhage.	

ADDENDUM.

Three cases of Nasal and Naso-pharyngeal Tumours.

No. of case.	Operator and reference, and year of operation.	Sex and age.	Disease and parts involved.	Nature of operation.	Immediate result.	Ultimate result.
1	Watson Cheyne. (3/3/92)	M 46	Sarcoma growing from base of skull, coming down left side of naso-pharynx, blocking eustachian tube, affecting upper part of soft palate. Glands in neck	Tracheotomy. Removal of glands, excision of left upper jaw and pterygoid process. Removal of tumour. Cauterisation of bone	Recovered	Recurrence in nose 15 months later. Growth cleared out but recurred there and in glands. Died $2\frac{3}{4}$ years after operation.
2	Watson Cheyne. (7/3/94)	F 45	Spindle-celled sarcoma growing from roof of nasal cavity and naso-pharynx, bulging the right eye outward and forward, destroying nasal bones and septum	Incision on right side of nose from forehead to nostril. Removal of tumour	Recovered	Well a year later.
3	Watson Cheyne. (22/12/95)	F 24	Lympho-sarcoma growing from base of skull and projecting into naso-pharynx	Soft and hard palate split, piece of hard palate and vomer removed, and tumour peeled off from bone. Nitric acid applied.	Recovered.	

The only larger statistics which, so far as I know, I have omitted, are 12 cases by Kronlein, with 3 deaths. These have not, so far as I can find, however, been published, with the exception of two, one of which was well at the end of 7 years. To include this one and not the others would vitiate the statistics. I have also come across references to the following cases, but have not been able to find full details, and probably they are not published in detail, viz. :— *Marchaud*—Partial extirpation of the pharynx; died of pneumonia on 7th day. *Trelat*—Cancer of tonsil and pillars of fauces; recovered. *Verneuil* (mentioned by Castex)—Epithelioma of tonsil, soft palate, pharynx, tongue and floor of mouth; died of glycosuria. *Labbe*—Epithelioma of tonsil, soft palate, pharynx, tongue and floor of mouth; recovered (? recurred). *Hueter*—Sarcoma of tonsil; death in 3 weeks, from pneumonia. *Hahn*—Removal of epiglottis; recurrence in 3 months (referred to by Schötz in 'Centralblatt f. Laryngologie,' No. 6). *Fischer* (referred to by Keitel)—Tumour of whole posterior wall of pharynx; recovered. *König*—3 cases (referred to by Keitel): Recurrent carcinoma of posterior wall of pharynx; recovered. Carcinoma of tonsil extending on to pharynx; died of septic pneumonia. Carcinoma of tonsil; died of septic pneumonia. *Billroth*—Lympho-sarcoma of tonsil, very extensive, vagus divided; death from œdema of the lungs. *Bergmann* refers ('Deutsche Med. Wochen.,' 1883) to a case where he removed a large piece of the lower jaw, tonsil, and almost the whole of one side of the pharynx, but does not state result. *Gallardo*—Extirpation of cancerous tumour of palate and tonsil in a male æt. 40; rapid recurrence in glands in one month.

Total Results.

[D = died. C = no recurrence for 3 years. R = recurred soon, and inoperable. H = healed, and well at last note more than 6 months after operation. H? = healed, but no note later than 6 months after operation. R (good) = a long interval before recurrence. R(H) = recurred, operated and healed. R(H?) = recurred, operated and healed, but no further notes.]

Group I.—Cases where the disease was removed from the mouth, with or without splitting the cheek, and with or without tracheotomy; where, in fact, there was no wound in the neck communicating with the mouth—

a. Carcinomata, 13 cases—2 D, 4 H?, 1 R (good), 3 H, 3 C.
β. Sarcomata, 10 cases—5 R, 3 R (good), 2 R(H).

Total, 23 cases—2 D, 4 H?, 5 R, 4 R (good), 2 R(H), 3 H, 3 C.
Mortality, 8·6%; no benefit, 30%; benefit, 25%; cured, 13%.

Group II.—Cases of disease in the pharynx where the internal wound communicated with a wound in the neck—

A. Where the disease was situated in or in the vicinity of the tonsils, and extended from thence to the neighbouring parts.

1. Where the jaw was not divided—

a. No tracheotomy.

α. Carcinomata, 6 cases—2 D, 2 R, 1 R(H?), 1 H.
β. Sarcomata, 5 cases—2 H?, 1 R, 1 R(H), 1 H.

Total, 11 cases—2 D, 2 H?, 3 R, 1 R(H?), 1 R(H), 2 H.

b. Tracheotomy.

α. Carcinomata, 9 cases—5 D, 1 H?, 3 R.

Total where jaw was not divided—

α. Carcinomata, 15 cases—7 D, 1 H?, 5 R, 1 R(H?). 1 H.
β. Sarcomata, 5 cases—2 H?, 1 R, 1 R(H), 1 H.

Total, 20 cases—7 D, 3 H?, 6 R, 1 R(H), 1 R(H?), 2 H.
Mortality, 35%; no benefit, 65%; benefit, 15%.

2. Where the jaw was divided—

a. No tracheotomy.

α. Carcinomata, 20 cases—4 D, 7 H ?, 7 R, 1 R (good), 1 H.

β. Sarcomata, 5 cases—1 D, 1 R, 1 R(H ?), 2 H.

Total, 25 cases—5 D, 7 H ?, 8 R, 1 R(H ?), 1 R (good), 3 H.

b. Tracheotomy.

α. Carcinomata, 16 cases—5 D, 3 H ?, 4 R, 2 R(H ?), 1 R(C), 1 H.

β. Sarcomata, 9 cases—3 D, 3 H ?, 2 R, 1 H.

Total, 25 cases—8 D, 6 H ?, 6 R, 2 R(H ?), 1 R(C), 2 H.

Total where jaw was divided—

α. Carcinomata, 36 cases—9 D, 10 H ?, 11 R, 2 R(H ?), 1 R (good), 1 R(C), 2 H.

β. Sarcomata, 14 cases—4 D, 3 H ?, 3 R, 1 R(H ?), 3 H

Total, 50 cases—13 D, 13 H ?, 14 R, 3 R(H ?), 1 R (good), 1 R(C), 5 H.

Mortality, 26°/₀; no benefit, 54°/₀; benefit, 14°/₀.

Mortality where no tracheotomy=19°/₀; where tracheotomy=38°/₀.

Total results of Group II., A.—

α. Carcinomata, 51 cases—16 D, 11 H ?, 16 R, 3 R(H ?), 1 R (good), 1 R(C), 3 H.

β. Sarcomata, 19 cases—4 D, 5 H ?, 4 R, 1 R(H ?), 1 R(H,) 4 H.

Total, 70 cases—20 D, 16 H ?, 20 R, 4 R(H ?), 1 R(H), 1 R (good), 1 R(C), 7 H.

Mortality, 28°/₀; no benefit, 57°/₀; benefit, 14°/₀.

B. Where the pharyngeal disease was at a lower level than the tonsillar region, or at any rate did not involve it.

α. Carcinomata, 9 cases—4 D, 3 R, 1 H ?, 1 H.

β. Sarcomata, 6 cases—2 D, 2 H ?, 1 R(H ?), 1 H.

Total, 15 cases—6 D, 3 R, 3 H ?, 1 R(H), 2 H.

C. Where the epiglottis was the centre of the disease.

α. Carcinomata, 4 cases—1 D, 1 H ?, 2 R (good).

β. Sarcomata, 2 cases—2 H.

Total, 6 cases—1 D, 1 H ?, 2 R (good), 2 H.

Total result of Group II.—

a. Carcinomata, 64 cases—21 D, 13 H?, 19 R, 3 R(H?), 3 R (good), 1 R(C), 4 H.

Mortality, 32°/₀; no benefit, 62°/₀; benefit, 12°/₀.

β. Sarcomata, 27 cases—6 D, 7 H?, 4 R, 2 R(H?), 1 R(H), 7 H.

Mortality, 22°/₀; no benefit, 37°/₀; benefit, 29°/₀.

Total, 91 cases—27 D, 20 H?, 23 R, 5 R(H?), 3 R (good), 1 R(H), 1 R(C), 11 H.

Mortality, 29°/₀; no benefit, 54°/₀; benefit, 17°/₀.

GROUP III.—Where the disease involved both pharynx and larynx—

a. Carcinomata, 55 cases—30 D, 4 H?, 14 R, 2 R (good), 1 H, 4 H (died without recurrence).

β. Sarcomata, 3 cases—2 D, 1 R.

Total, 58 cases—32 D, 4 H?, 15 R, 2 R (good), 1 H, 4 H (died, well).

Mortality, 55°/₀; no benefit, 81°/₀; benefit, 12°/₀.

	Mortality.	No benefit.	Benefit.
Group I.	8·6°/₀	30°/₀	52°/₀
Group II.	29°/₀	54°/₀	17°/₀
Group III.	55°/₀	81°/₀	12°/₀

February 24th, 1896.

OBSCURE FORMS OF RENAL PAIN.

By Charles Henry Ralfe, M.A., M.D., Cantab., F.R.C.P.

Mr. President and Gentlemen,—The question that is before the Society to-night is that of dealing with obscure forms of renal pain, and to discriminate between those forms of nephalgia which call either for surgical or medical treatment. In most cases the boundary line is fairly well marked; we have either pus in the urine, traces of blood, minute crystalline calculi, with well marked colic with vomiting, tumour in the renal region, and other definite symptoms of renal disease, requiring surgical treatment. On the other hand most if not all of these distinctive symptoms may be absent, only extreme and almost constant nephalgia being present, and the nature and character of the renal pain has to be accounted for, and probably treated upon a medical basis.

Taking for analysis a varied number of cases, I find they naturally fall for classification into four groups :—

(1) Pain from *reflex nerve disturbance.*
(2) The aching kidney.
(3) Gouty attacks periodically affecting the kidney.
(4) Disease of the kidney, but not giving rise to such determinate symptoms in the urine, or to a tumour in the flank, as would do more than arouse suspicion.

(1) *Reflex nerve disturbance giving rise to kidney pain.*—Dr. Habershon, in his lectures on diseases of the liver, as Lettsomian Lecturer to the Medical Society, 1866, made the original statement, "that in valvular disease of the heart, particularly of the aortic valve, severe and colicky pains frequently radiated down into the right hypochondriac region." In 1877, the late Dr. Murchison called at my house one morning with a sample of urine, which he had passed during and after a severe attack of colic during the night, and he was perfectly convinced that he had a calculus in the right kidney. The

urine was perfectly normal and showed absolutely no sign of renal irritation, nor had he been sick. A sub-cutaneous injection of morphia had speedily relieved the nephalgia. I showed him Dr. Habershon's observation, and that seemed to reassure him. He had, I believe, two other such attacks before his death from aortic disease, in 1879, about which I believe he consulted Professor Burden Sanderson. One other such case occurred in the out-patient department of the London Hospital, the patient being admitted, suffering from severe renal colic, which he had had of late repeatedly. The urine was perfectly normal, but, on listening over the aortic space, a loud double murmur was heard, and the left ventricle enlarged. He died suddenly shortly afterwards. I have left myself but little time to bring forward other disturbing reflexes, especially those associated with thoracic and abdominal aneurysms. One of these I must mention was that of a gentleman who for several years had suffered from symptoms of left renal calculus, except the absence of urinary symptoms. Had he lived in these days of abdominal surgery no doubt the mystery would have been cleared up, which was not till his sudden death. He became collapsed, and, on a *post-mortem* examination being made, the belly was found full of blood, which was found to proceed from a small aneurysm, the size of a cherry stone, from a branch of the mesenteric artery. Nor is the nephalgia due to the formation of scybala in the ascending and descending colons of less importance, indeed it is one of the most frequent causes of renal pain, especially in delicate women. The pressure of the colon filled with hard scybalous masses as it passes over the kidney not only gives rise to intense pain, but if the kidney is already the seat of nephritis it often causes the appearance of blood, and sometimes pus, in the urine, which, without careful observation, may, from the nephalgia, lead the physician into the error that the pain is due to calculus. With regard to reflex irritation from other organs, it is only necessary to refer to the intimate nervous connection existing between the bladder and renal organs.

(2) *The aching kidney.*—This we generally associate with the movable or floating kidney. But there is a condition which often occurs in young ladies in whom no mobility of the kidney can be detected, which gives rise to severe pain and tenderness over the right kidney, indeed at times the kidney can be felt distinctly enlarged. The cause of this condition is the wearing of tight

corsets which press down the liver, so that when any exercise, such as lawn tennis or hunting, is engaged in, involving a powerful contraction of the abdominal muscles, the kidney, or the fat round the kidney becomes bruised, and a modified degree of perinephritis is set up. This is a very troublesome condition to deal with. For unless the patient will consent to a thorough carrying out of the treatment in the 1st instance, the inflammatory trouble will constantly recur, till the case becomes chronic. Sometimes the original jolt is so severe as to cause syncope. After some hours a feeling of aching sets in over the kidney accompanied by a rise of temperature, 101°–103° F. There is tenderness over the flank and sometimes vomiting. After a few days in bed, under active treatment, the tenderness diminishes, the temperature falls, and the patient cannot usually be persuaded to stay in bed. But on rising from the recumbent position the patient finds that the pain recurs, though, perhaps, not with the same severity. If the patient will now consent to remain in bed for a whole month, including one menstrual period, matters will no doubt go well. If, however, she is constantly moving out of bed, she still suffers almost daily from aching pains in the affected organ, although the persistent pain, the swelling of flank and tenderness may have left. The same occurs in cases in which the lesion was slight in its inception, and as a consequence did not receive sufficient attention at first, till it drifted into the neuralgic state. These latter cases are sometimes difficult to discriminate from those of actual kidney disease, since, after a time, a very small purulent deposit is to be met with in the urine. This is very slight, but I have seen several cases in consultation to which I could arrive at no other conclusion but that we were dealing with an aching kidney, as the previous symptoms were in accordance. Other injuries cause bruising of the kidneys, on either side, in both sexes. But direct injury to the renal organs seem to be followed by less continued pain than this indirect shock.

The aching kidney is also frequently caused by variations of some of the normal constituents of the urine, such as increase of urea, "azoturia," increased acidity, or considerable deposits of oxalates and phosphates.

With regard to the first instance, I was called to see a gentleman, age 47, residing in the S.W. district. He had been ill some months. Up to the last two or three years he had led

an active professional life in one of the northern counties, walking and riding daily a great many miles in the open air. However, he sold his practice and bought an easily-worked business, chiefly among the better classes, and, as he did not care much for work or to extend his practice, he had no extra strain. Indeed, on the contrary, instead of being an active man he entirely changed his habits; instead of walking to see his patients he drove about in a closed brougham, lived well, and particularly went out to the late suppers for which the district is so famous. After about two years he noticed a decline in his health. His digestion became disordered, and the slightest exertion brought on intense weariness, so that he had to recline for long periods on the sofa and get one of his medical friends to see his patients. He lost flesh steadily, and in about three months he was seized with violent pain in the left kidney, which he described as affecting the lumbar as well as iliac region. He attributed this pain to a slip or strain, but nothing very definite could be learnt about it. He became anxious, and his mind dwelt on renal calculus, so he consulted a specialist, who not only pronounced for calculus, but that it was one of oxalate of lime. He prescribed some remedies, but foretold that an operation would probably be required. He went on for some time, but was not satisfied with the diagnosis, especially with the statement that it was an oxalate of lime calculus. No blood or pus could be discovered in the urine, which, indeed, except for its high specific gravity, was perfectly normal. So he called in Dr. Wilson Fox, who thought that, in view of the emaciation and great weakness, the pain was due to a nodule of cancer, not sufficiently developed to cause hæmorrhage or enlargement of the kidney. It was shortly after this I was asked by a mutual friend to see the patient. I first examined the urine, and found it of a specific gravity of 1·045, and on asking if it had been constantly so, I was told that whenever it was tested, it was found high. On applying the qualitative test of strong nitric acid the mixture became solid with crystals of urea nitrate. On examination of 100 cc. of urine, it yielded 89 grammes of urea. The other constituents were slightly in excess, especially oxalates. It was now plain that the case was one of azo-turia. Under appropriate treatment, limiting the nitrogenous food, forcing him to walk every day, he soon got better, and started for a long holiday when I last

heard from him he had been married, and had gone for a trip round the world, and some time later he entered Parliament, and has, since he resumed a life of activity, regained complete health and vigour. Usually the aching pain is over both kidneys, but it is probable the strain he experienced before the pain set in may have made the left kidney more sensitive, and caused its limitation to that organ.

Another case I would relate with respect to increased acidity of urine, is that of a young woman, aged 27, who was sent into my ward at the London Hospital, supposed to be suffering from renal calculus. The urine was carefully examined, but nothing abnormal found, except a high degree of acidity. The quantity and specific gravity were both normal. There was a history of occasional deposits of uric acid, but none appeared during her stay in hospital. She suffered for several hours every day from intense aching of the left kidney, which was tender on pressure, especially in front, but the pain was not increased when she took exercise. I was a little puzzled for some time, thinking a stone might be impacted in the pelvis or ureter, and that morbid urine could not thus descend into the bladder. There could be felt a hardened irregular mass just in front of the kidney, but this, on the administration of an enema, proved to be hardened scybala. She was easier for their removal, but the renal pain was still considerable. With a view to the possibility of its being calculus, she was placed on distilled water every three hours, and a mixture of citrate of potash with buchu given thrice daily, a double dose being given about 2 a.m., in accordance with Sir William Roberts' suggestion. The urine at once increased in quantity, and, as the acidity diminished in consequence, the aching pain in the kidney subsided, till, in a month's time, she left the hospital perfectly well. No doubt in this case a tendency to uric acid deposits was the first factor, but the determination of the pain to the left kidney was the pressure of the hardened scybala in the descending colon over the front of that organ. The continuance of the pain was, however, caused by the irritation of the highly acid urine, and, till that was neutralised, it did not subside. However, no patient I have known has had a narrower escape from operative procedure.

The renal pains that patients suffering from oxaluria and phosphaturia experience is so well known that I need not enter

into details. Perhaps the pseudo aching kidney, which numbers of hysterical women complain of, should be taken into consideration, as if they are at all read in the subject they may easily deceive us, even attempting to imitate urinary deposits. Some time back Dr. Glover sent me a small fragment, of greyish brown colour. This was at once incinerated, and it decrepitated violently, giving off the odour of burnt organic matter, and the ash effervesced with HCl. These were the natural reactions for oxalate of lime, and I intended to write to Dr. Glover to that effect. However, on looking at the slide some hours later, I noticed some gritty particles, which I had not observed when the ash was in effervescence. On examining an untouched portion of the fragment I found sandy particles, a few bristles of hair, and carbonate of lime. I afterwards heard she had been observed chipping out little bits of mortar from the garden wall.

3. *Gouty Paroxysm of the Kidney.*—Many may object to this designation, but we have the authority of Professor Virchow that he experienced an attack of such a character in his own person. He states that on rising one morning he found great pain on micturition, that the urine was purulent, containing innumerable small crystals of uric acid, and traces of blood. The pain extended up the ureter, and the left kidney was especially tender. Rest and alkalies soon put matters right, and the professor inferred that he had had an attack of true paroxysmal gout, affecting the whole urinary tract, especially of the left side. This form of gout is not to be confounded with the gouty nephritis that often attacks persons who have suffered from arthritic gout, nor even the so-called "kidney gout" of Ebstein, but a true inflammatory attack like what occurs in the big toe joint. And if we recognize the existence of an acute gouty pneumonia, or gouty hepatitis, why should we not admit the existence of a gouty paroxysm of the kidney? This form of kidney trouble is perhaps one of the most difficult to diagnose in coming to a determination between nephritis and renal colic. Perhaps our best aid to diagnosis lies in the fact that between the paroxysms the urine becomes normal in character. Two cases will serve as an example. The first was that of a middle-aged man, of temperate habits and simple life. For some three years past he had suffered from what appeared like renal colic, with great tenderness over

the kidneys, chiefly the left, but occasionally the right, but what is interesting to note, with its relation to frank gout, never both kidneys at the same time. He had consulted many specialists, and the surgeons were of opinion that an exploration of one of the kidneys, at least, should be made. However, as he dreaded an operation, he fell back on the physicians, one of whom advised him to see me, and to take my opinion for or against an operation. I saw no immediate necessity for an operation, but advised him to rest in bed on his back for six weeks, to drink Kronenquelle and Salutaris water, to have all his beverages made with soft water, and to give up sugar. So long as he remained on this plan, no attack occurred. Indeed it was three months when he came to me again, suffering from an attack of colic, with purulent and bloody urine, some albumen, and a few granular casts, and abundance of small crystals of uric acid. He said, however, the attack was much less severe, and the interval longer than any previous one. I advised him to try rest for a longer period as I thought the stone might become encysted. But his position could not permit of a prolonged absence from business, so it was agreed only to go on with the solvent treatment. After this he came to me at rarer and rarer intervals, and at each time the attacks were less and less severe. At last I lost sight of him for two years. On his return it was for a different complaint. He said that the renal attacks had quite disappeared for about a year, but he had been sent by his department to the north-west coast of Ireland, where it was extremely damp, and, immediately after, experienced stiffness in his joints, especially in the neck (which was quite bowed) and in the knees. He suffered little pain, and nothing like an acute attack of gout was experienced. In fact the mischief was rheumatoid arthritis, which has since considerably developed so as almost to cripple him. I see him now about once a year, but he has never since complained of the renal paroxysm since the commencement of the arthritic attack.

The other is the case of a lady, aged 47, rather stout and of full habit. She consulted me in the spring of 1895 for renal calculus, and I certainly thought one was present. There was pus in the urine, and a little blood. The attacks of colic were not very frequent and came on usually after severe or sudden exertion. The question of operation was discussed, but I thought, as the attacks were not very frequent, that rest and the solvent treatment

might eventually bring away the stone. I prescribed soft water in all beverages, the use of Kronenquelle at meals, and a mixture of citrate of potash and buchu. She wrote to me four months afterwards to say she had had no attack since commencing the treatment, and again, in January of this year, that there had been no further return of the symptoms, and asking if she could now give up the treatment which she had persevered in throughout. I replied that she might lessen the amount as regarded the mixture, but to keep strictly to the soft water, Kronenquelle, and the diet prescribed. I think I can have no hesitation in declaring the attacks due to gouty paroxysm, as the urine, since the attack I first saw her in, has always been perfectly normal, and contained neither pus nor microscopic blood. I could quote other cases pointing in the same direction, but our time does not permit.

4. *Diseases of kidneys.*—On the border-line of medicine and surgery there are cases of doubt which may arise as to a correct diagnosis in which both parties are equally undecided. Take, for instance, sudden suppression of urine. If the ureter of a solitary kidney is suddenly blocked with a calculus, no difficulty ought to be experienced, since the enlarged kidney can usually be made out. But where double suppression occurs, especially in young persons, it is often difficult to say whether the attack is due to acute suppression of urine, or blockage of both ureters simultaneously with calculi. Two cases will illustrate the two points, and the attendant difficulties of diagnosis. One, a young lady whom I saw at Lewisham with Dr. Brookhouse, had risen the previous morning unable to pass water; this went on all the next day, when I saw her in the afternoon. There was no renal symptom, such as pain or tenderness, and not a single drop of urine had passed which could guide us in our diagnosis. Ten drops of turpentine were ordered to be given every four hours, and this, on the third day, brought away a few drops of bloody muco-pus.

The pulse throughout had remained quiet, and it was agreed that if it became intermittent an exploratory incision should be made. On the fourth morning she was still about the same, perhaps a little restless, but there were occasional intermittences of the pulse. It was arranged that Mr. Godlee should be ready at any time, on receipt of a telegram, to explore one or both kidneys, and at two o'clock the left kidney was incised, the capsule was

found tough and adherent, the cortex more fibrous than usual. On slipping the finger into the pelvis a thick gritty deposit was felt, and on withdrawing the finger a small gush of urine escaped. The uric acid deposit was then cleared away and a hunt was made for the stone. This Mr. Godlee found rather deep down in the ureter, and was able to withdraw it. After this all went well. About a fortnight after the other kidney was operated on. Both calculi were oat-shaped and fitted tightly into the ureter.

The other was a young man, a butcher, aged 24, who was admitted into the London Hospital, suffering from acute suppression of urine. He had left home feeling perfectly well, when he had a sudden pain in his loins shooting round into his belly—shortly, he had an urgent desire to make water, which he did with great difficulty, and which was bloody. This gave immediate relief. After this he passed no urine till his admission into the hospital. Here again there was no indication as to the cause of the suppression of the urine. The pulse was rather quick, 95, and the temperature 99° F., the face rather flushed. The kidneys, after careful palpation, gave no sensation of enlargement, nor of tenderness on pressure. With regard to the question of diagnosis, perhaps the suddenness of the pain and relief by the hæmaturia, and his occupation, rather tended to point to stone. Fomentations round the back and belly were ordered, and he was given copious drinks. I saw him on the third day after his admission; he was in the same state as described. The question of operation was discussed, but on consideration we thought that as we had no indication of the existence of a single kidney, and that in a stout, plethoric man, it might be an attack of congestive nephritis, we had best leave matters alone till other symptoms developed. On my next visit to the hospital I saw my friend sitting up in bed, looking very happy. "Have you passed your stone yet?" "No, sir; but the day after you saw me I began passing pints and pints of bloody urine."

I cannot help concluding these remarks with a happy-go-lucky case, which shows that we should not be bound by too hard-and-fast rules. A middle-aged man, a gardener, was sent to be under my charge at the London Hospital. He had an enormous renal tumour, very hard and tense, but in some places I could detect fluctuation. I held a consultation with some of my medical and surgical colleagues, but as the man was already greatly emaciated

and the hardness extended deep down into the left side of the pelvic region, and he was still rapidly emaciating, it was considered to be malignant disease of the pelvic glands, obstructing the upper outlet of the ureter, and no operation was therefore advised. But one night the house physician was called up and found him in such awful agony that he at all risks drove a trocar through the lumbar region, and about three pints of bloody urine followed. The bladder urine contained blood for some days, but after that it cleared up, the man regained flesh, the fistula made by the trocar healed, and the patient has returned to work.

CAN ANY DIAGNOSTIC INFERENCE BE DRAWN FROM THE CHARACTER OF THE PAIN OF STONE IN THE KIDNEY?

By E. Hurry Fenwick, F.R.C.S. Eng.

Renal pain which has lasted for months or years, and which cannot be controlled by medical treatment, calls for operative relief more often than does any other symptom due to surgical disease of the kidney and ureter. Severe renal pain is, moreover, a cardinal symptom of which, I think, we know comparatively little. Now, the operating surgeon alone has the power of examining the condition of the kidney in the fresh state and of comparing the alterations he discovers in it or around it, with the character of the pain the patient is complaining of. He should, therefore, be in a position to obtain accurate facts and should be able to throw some light upon the causes and vagaries of renal suffering.

My own knowledge of the matter is necessarily restricted, for my material is not large. I have seen sufficient evidence to lead me to believe that important rules of diagnosis may be framed if only a sufficiently large array of reliable facts could be obtained. I have, therefore, ventured to bring some notes of my own experience before this Society in the hopes that the ventilation of the subject may attract a large amount of accurate material. At the same time, I seize the opportunity for putting in a plea for the more exact record of the position and character of the disease in the kidney discovered by operation, and for fuller details of the

symptoms observed. My own material consists of 80 cases of exploration of the kidney. This series includes nephrectomies, nephrotomies, and nephrolithotomies.

I mention briefly I have lost in this series, after the operation, six patients. One after nephrectomy, for malignant disease; three after nephrotomy, for obstructive and septic suppression; one after nephrotomy, for arrest of hæmorrhage and for severe crush of the kidney; one after exploration, for advanced malignant disease. Probably, in three instances, the malignant cases and the crush, my procedure accelerated the death of the patient.

The simplest and the most exact producer of renal pain is, probably, a calculus. Uncomplicated cases of stone in the kidney should, therefore, afford us the best basis of studying the various phases of renal suffering. I have taken a series of cases of non-suppurative renal stone so that the errors of pain attending inflammation and abscess should not creep in. I have been as exact as possible concerning the position in which I discovered the calculi in the kidney. With these positions I have contrasted the symptoms complained of. The deductions are open to criticism, but I believe that they indicate two distinct types of pain: one, that produced by irritation in the cortex, and the other dependent upon irritation of the pelvic mucous membrane.

The operating surgeon meets, broadly speaking, with two classes of stone in the kidney. Those situated in the pelvis in contact with the mucous membrane, and those lodged in a smooth cavity in the cortex of the kidney, almost under the true capsule of the gland. This fact has probably been accepted ever since Mr. Henry Morris laid the true foundation of renal surgery. But that stones in these two positions generally produce different forms of pain and evoke different symptoms is not, I suspect, generally realised. Every student is familiar with the character of pain produced by small loose stones in the pelvis of the kidney. I lay a stress on the term *loose*. The typical renal colic, the radiation of the pain to the testis, groin, and thigh, the intermittent pain felt over the front and back of the kidney, its aggravation by exercise, dietitic imprudence, and climatic changes, the admixture of blood, pus, and mucus in the urine—all these are the bold and well-known outlines of one of our best clinical pictures.

When, however, the pain in the kidney is mostly fixed and constant, when it does not radiate, when renal colics are never

noticed, when the urine is normal, and when there are no other symptoms pointing to renal disease but the location of pain in the renal region, the practitioner often refers the pain to other causes, for it is not generally accepted that these symptoms may be caused by a stone lying in the cortex near the capsule of the kidney. Let me furnish this example of a cortical stone under the capsule of the kidney.

I. A., aged 40.—For 18 years the patient had suffered from continuous pain in the right kidney. It was at first very severe, of a stabbing character, which he could localise with the point of his thumb placed on the loin under the last rib. At first it was intermittent, lasting a couple of hours or even a day. There were no radiations. He was admitted into a hospital and remained there two months. He got better and went to work, but the pain became as bad as ever in a fortnight. Four years ago the pain became aggravated, it was still in the same spot. He could still cover it with the point of his thumb and it never radiated. He never had any attack of renal colic. He could not sleep unless he lay on the painful side. If he unconsciously turned over in bed on to the left (the unaffected side) he was immediately awakened by the pain and had to turn over onto the bad side. The urine was acid, perfectly clear, apparently normal. The specific gravity was 1012; it was free from albumen. He never had had frequent micturition, nor any symptoms referable to the lower urinary organs. I diagnosed from his symptoms, with which I had become familiar, that he had a stone in the posterior surface of the kidney under the capsule. On the kidney being exposed, a softened area was discovered in the middle third of the posterior surface midway between the convex border and the hilum. On scratching through the softened roof a cavity was opened and a stone removed.

A second case.—This stone I removed from under the capsule of the middle of the posterior surface of the right kidney of a man aged 40. For seven years he had suffered from a dull pain from back to front of the kidney. The pain never radiated, he never had colics. The urine was 1030, clear, acid and normal in every respect, except that it contained an abundance of oxalates.

Such stones placed thus nearly always possess the same character and symptoms. The pain is usually felt at the angle which the last rib builds with the erector spinæ. It is so localised that it

may be covered by the patient with the last phalanx of the thumb of the corresponding side. It can be elicited by percussion or succussion or by exercise. It is liable to exacerbations. The pain, however, never radiates downwards towards the testis, groin, or thigh. There are no colics, the urine is normal, and blood may never have been noticed. One very curious difference is the way in which patients obtain relief from the pain of pelvic stone to that of cortical stone. In the pure cortical stone the patient is almost at once relieved by lying down, whilst in pelvic stone the position of relief appears to be in bending the body forward.

The manner of sleeping is in many cases typical in cortical stones. In a cortical stone on the posterior surface the patient usually sleeps, by necessity, on the kidney in which the stone is embedded. If by chance he should turn over in the night on to the side in which the kidney is free from stone, he is awakened by pain in the affected kidney and has to turn over on that side. In pelvic cases, if the mucous membrane is fretted or inflamed by the stone, the patient lies on the unaffected side so that the kidney containing the stone is exposed to no pressure. The posture adopted in this latter case is best observed in infants or children who are passing gravel from one kidney; they nearly always turn over on the nurse's lap so as to lie on the unaffected side. If the stone is smooth or the pelvic mucous membrane uninflamed, there is apparently no discomfort noticed from sleeping on either side.

I need hardly say this rule is not absolute. No rule is absolute in dealing with so variable a sensation as pain. It is worth while, however, to collect a large number of cases to ascertain if it is sufficiently often met with to constitute a reliable guide to the presence and position of a stone in the cortex. I have, however, placed much reliance on this position test as indicating the presence of stone, and of its pointing the position to be outside the pelvis. For instance, here is a calculus I diagnosed and removed from the tail of the kidney of a young man, whose chief complaint was a fixed but a severe renal pain and an inability to lie on the unaffected side.

Roughly, then, there are two great groups of simple renal stones. In each class characteristic pain may be felt. In the true cortical the pain is fixed and continuous. It is liable to exacerbation upon movement but not so much upon diet. To the pelvic irritation

and ureter obstruction belong the colics, the radiations to the neck of the bladder, the groin, the testicle, the thigh; the variable quantity of urine, the bladder irritability. Upon the change in the mucous membrane of the pelvis depend the addition to the urine, mucus, blood, and pus. Unluckily our cases are not all so simple. There are many cases which do not fall into these two groups. On analysing their symptoms and the position in which the calculi are found, it will be seen that their characters partake partly of both primary classes, the pelvic and the cortical, and that apparently they approach in similarity one or other of the two primary classes, in proportion as they are situated nearer to the pelvis, or nearer to the cortex. Thus, in some patients, the urine remains clear and normal for years, but the pain radiates into the testis; in others, with healthy urine, colics are suffered from, suprapubic pain is complained of. In others, again, frequency of micturition and marked variation in the amount of urine daily secreted is noticed. The clue to these varying and mixed conditions lies, I believe, in the small sac which contains the stone having some fine channel of communication with the pelvis, or in the fact that the stone in the cortex presses directly on the lower opening of the pelvis.

Permit me to draw your attention to the manner in which some channels extending from the calyces into these sacs containing these stones may be produced. It is not, perhaps, difficult to imagine a small piece of grit in the fine channel of a calyx, enlarging by accretion from the urine which pours over it from the papilla. As these cases suffer for years—20, 25, 7, 10, 20, 21, 10, 7, 16 years, to quote from some of my cases—the stone confined in the deep calyx, hollows its way posteriorly, rarely anteriorly, and approaches the cortex. Or to look upon the construction of these parenchymatous stones in another way, some of the grit, which is known to occasionally line the collecting tube in infants, may partially block that microscopic channel, and in the course of years develop into a smooth lined cavity pressing outwards through the parenchyma of the kidney, towards the cortex, remaining unconnected with the pelvis. Whichever way, however, these sacs which contain the imbedded stones are produced, it is certain that a large number of those which abut on the pelvis or its ramifications, are in communication with the mucous membrane by means of a fine channel. It is probable that any

traumatism, or slight flush in the wall of the sac, spreads on to the mucous membrane of the pelvis, and temporarily produces the symptoms of pelvic stones. They still retain two distinguishing symptoms of cortical stones, that is, the posture in sleep and the apparent health in the urine.

As examples of this intermediate group, I quote a dozen cases (*vide* list). In nine out of the twelve the posture was typical, that is, patients were unable to sleep, except on the affected side. But other symptoms, such as radiation, colic, hæmaturia, were noticed as they were found nearer the pelvis or its branches. It must be remarked, however, that in all cases, though the history had extended over two years, the urine was of good specific gravity, acid, clear, and contained oxalates. A faint trace of albumen was usually discovered, and this may be explained by the microscopic amount of blood, or blood casts, which is almost always present.

As good examples of stone imbedded in the kidney, with a part projecting out into a deep calyx, I quote the following:—This stone, which had evidently had its greater portion imbedded in the fleshy part of the kidney, and its nose water-worn by streams which passed over it, was removed from the tail of the kidney of a man, aged 36, who for 20 years had been unable to follow any active employment. He had been in several hospitals, complaining of extreme renal pain, but as his urine was normal, his sufferings were considered to be feigned or exaggerated and nothing was attempted. His pain was very typical in character of cortical stone. It was situated in the kidney, and he could cover its position with the last phalanx of his thumb. It could be elicited also by percussion of the renal region or by any succussion of the body. It came on with any exertion, even with walking. It was also noticed that it was more severe if the quantity of urine passed in the day was small, 12 oz., but relieved if the quantity was normal, 48 oz. The patient had never had colic, nor any radiating pain beyond a left testicular pain if the renal suffering was acute. Sometimes he suffered from great frequency of micturition in the day, and occasionally had to rise five or six times in the night, passing very little at a time. He had never noticed blood in his urine. The latter was clear, sp. gr. 1,020, it contained no pus or blood, and only a few oxalates were visible under the microscope. The urine contained a slight amount of albumen. I diagnosed imbedded cortical calculus, and

removed this stone. The man is now leading an active and laborious life.

Incidentally, permit me to point out that the stone-producing area in the kidney is the lower half. That the posterior surface is the most frequent position in which the cortical stones are felt. That the lower calyx should always be pinched, for the lower calyx dips into the tail, and collections of stones can be felt here grating against each other.

I should like to add a few words upon the prolonged disappearance of pain in the kidney due to the friction of stone. Imbedded stones rarely, if ever, lose their power of producing pain. I believe that once an imbedded stone has formed, it will go on worrying the patient until the end of the chapter. Of course there are exceptions. Here is one. The patient from whom this cortico-pelvic stone was removed, asserted that he applied, after two years of continuous and severe pain, to an out-patient surgeon of one of the largest hospitals. This surgeon took up a long needle from his table, and ran it into his kidney, and said he had touched the stone. Immediately the pain was relieved, and did not return for 12 years, when it was again felt, and after a few more years of suffering, he had this removed from the cortex. I puzzled over this for some time, and noticed how, in removing stones, the sac fills with blood and covers over the prickly interstices of the stone. It was suggested to my mind, that, perhaps, the needling had brought a coating of blood-clot round the stone and this, by transformation of a low form of connective tissue, had fixed and padded the stone. It raises a suspicion in my mind that in some of the cases, in which I could not find any stone, and yet were much relieved by the operation, that possibly the manipulation of the cortex had enveloped the stone in a blood-clot, and so glued up the stone in its sac. On the other hand, pelvic stones, when they become large and fixed by their branches, often become painless or at least bearable. Should, however, ill-health, such as an epidemic influenza overtake the patient, an increase of the pain and of the pus, which is invariably present in the urine, supervenes.

Dr. Chapman asked whether there was greater frequency of micturition in the cortical than in the pelvic cases at night.

Mr. Swinford Edwards referred to a case in which he had removed a large stone measuring an inch in length by half an inch in thickness. It was at first thought to be in the pelvis, because the tissue over it was

[*To face page* 288.

Sex, Age.	Symptoms.	Urine.	Sleep Posture.	Position of Stone in Kidney.
M., age 29. 2 years' history.	Pain in right loin running to groin and thigh; testicle retracted; renal colic every month.	Urine acid, 1020; oxalates; microscopic blood.	Cannot sleep on healthy side.	Stone middle third of kidney, junction of cortex and pelvis; *posterior surface.*
M., age 33. 10 years' history.	Pain in left lumbar, at first intermittent, now continuous; exacerbations daily, "pinching."	Urine 1014, acid; oxalates; clear traces of albumen.	Cannot sleep on healthy side.	Tail, posterior surface in cortex.
M., age 40. 20 years' history.	Right renal pain running down to groin, always present; occasional colics.	Urine 1015, acid; crowded with oxalates.	Cannot lie on healthy side.	Posteriorly lower third at edge of cortex and pelvis, in cortex.
M., age 45. 25 years' history.	Continuous right renal pain, blood once; *no radiation.*	Urine 1012, acid, clear.	Could not lie on healthy side.	Middle of posterior surface.
M., age 35. 7 years' history.	Dull pain from back to front of right kidney; never radiates; no colics.	Urine 1030, acid; innumerable oxalates; a few pus cells.	Always lies on right side or on back.	Under capsule, about middle —posterior surface.
M., age 52. 10 years' history.	Fixed left renal pain; covers area with thumb; *no radiation;* passes blood; increase by errors of diet.	Urine 1022, clear; urea 2 per cent.; pus microscopically.	Always lies on left; cannot lie on right.	Deep calyx about centre of kidney; several stones.
M., age 29. 21 years' history.	Dull pain in right side, passes into right testicle if bad; *influenced by diet;* never colics.	Clear urine 1020, acid; many blood casts; oxalate.	Lying on right side eased him—always sleeps on right.	Posterior surface in cortex of layer over pelvis, middle.
M., age 39. 20 years' history.	Pain in left loin, shooting to left testis, into left side of abdomen; covers painful area with his thumb.	Urine 1020, clear, no albumen, no casts.	Lies on back with legs drawn up—either side after operation.	Posterior surface towards lower third, embedded partly in deep calyx.
M., age 31. 7 years' history.	History of stone removed from urethra at 8 years of age; left kidney pain for 7 years; suprapubic pain 4 years; colics every fortnight; *F. varied;* hæmaturia.	Urine 1015, acid, clear.	Sleeps *either side.*	Cortex of tail opening into lowest calyx; five pointed stones.
M., age 29. 5 years' history.	Pain commenced in testicle, then after 2 years it came in right kidney; colics, and right testis pain; blood, no frequency.	Urine 1018, acid; few oxalates; innumerable blood cells.	Could sleep on either side.	Posterior surface middle third, abutting on pelvis, probably communicating with a calyx.
M., age 30. 2 years' history.	Fixed right lumbar pain; occasional radiation into right testis, groin, and thigh; pain constant but liable to accentuation; no pain on palpation or percussion; F. in painful attacks.	Urine 1025, acid; few pus cells; urea 2 per cent.	It does not trouble him to lie on left side.	On anterior surface over edge of pelvis, probably abutting on a deep calyx.
M., age 38. 16 years' history.	Pain in left kidney; many colics every day; radiations to groin; kidney swelled; passed a stone.	Urine 1022, acid, clear.	Unable to lie on healthy side.	Felt in upper part of upper calyx through anterior surface.
M., age 18. 5 years' history.	Pain in left kidney, continuous; no radiation: never colics; passed blood on exertion.	Urine 1012, clear; traces of albumen; oxalates.	Cannot sleep on right side without pain in left.	Posterior surface at junction of pelvis with cortex, and just under capsule; junction of lower and middle third.

very thin, and on taking it out it did not appear to be water-worn. Mr. Fenwick, however, who happened to be present, believed it was a cortical stone, and he himself was disposed to think that this view was correct. The man had had hamaturia two years previously, but not since, and he had suffered from fixed pain which did not radiate to any appreciable extent. He thought that this case bore out the author's observation in respect of the special symptoms of cortical stones.

Mr. Hurry Fenwick, in reply, pointed out that pure cortical stones never produced any irritation of the pelvis, and, consequently, the bladder remained quiescent at night. Frequency of micturition was mainly observed in cases in which the stone lay in or abutted on the pelvic cavity of the kidney.

MR. SYDNEY ROWLAND ON THE NEW PHOTOGRAPHY.

Mr. Sydney Rowland gave a practical demonstration of the methods of the new photography. Starting from a simple electric spark produced by a large induction coil, he proceeded to show how the character of the spark was entirely altered by diminishing the pressure of the gas through which the discharge took place. Thus, instead of the usual characteristic noisy and defined streak of light, there was produced, when the air was exhausted in the tube, a continuous column of light. As the air was further exhausted and the pressure diminished, the light was seen to withdraw from the negative pole while remaining continuous with the positive. The withdrawal of the column of light from the negative pole exemplified in a most striking manner the phenomenon discovered by Professor Crookes, and named by him the dark space. He then proceeded to show some extremely beautiful Crookes' tubes, one in particular, in which a light mica vein was mounted, and which revolved under the influence of the cathode rays, showed very well the large amount of mechanical energy these rays contained. Having demonstrated this point he pointed out that a supply of mechanical energy being present, it was easy to understand, on the theory of the mutual convertibility of all forms of energy, how that peculiar form known as Rœntgen's X rays might be produced by some intrinsic transforming power in the substance of the glass walls of the tube. Mr. Rowland then proceeded to take skiagraphs of various objects enclosed in an opaque box. The plates were immediately developed and the results shown to the audience by means of a lantern. Two successful skiagraphs of hands were then taken,

one of which showed, with absolute precision, a certain deformity in the bones. Mr. Rowland claimed to have been first in this country to systematically investigate Professor Rœntgen's discovery from the point of view of its medical and surgical operations.

March 9th, 1896.

THE PHYSIOLOGY AND PATHOLOGY OF THE THYROID GLAND.

By Victor Horsley, M.B., F.R.C.S., F.R.S.

I take it that what ought to be the substance of what I say to-night is the relationship of scientific laboratory investigation to the progress and improvement of therapeutics. This, however, if treated with severe accuracy would practically amount to a recapitulation of historical facts which are, in the main, very familiar to you.

I do not, therefore, propose to expend more than a short period of the hour allotted to me in touching upon old ground, but I desire to lay before you some conclusions derived from observations which I made in 1884–86, but have withheld from publication until now, for the reason that so many side issues came in from the original facts, and required collateral investigation, that I confess I was tempted to put the points aside in favour of more easily attainable knowledge, and which, at least in the case of cerebral localisation, proved of somewhat more immediate value.

Moreover, inasmuch as I published in Virchow's 'Festschrift,' 1891, an historical summary of the investigations which have led to the greater elucidation of the functions of the thyroid gland up to that date, I may be excused dealing at length with the history previous to 1891.

Nearly 100 years ago, King, of Guy's Hospital, showed by direct experiment that the colloid material of the acini of the gland passed into the lymphatics, and thus, for the first time, was

suggested in a tangible form, the modern view of the so-called internal secretion of the thyroid gland. During the subsequent 50 years, and at a time when, with the exception of snake poison, no animal fluid was known to have a very powerful influence on the body when administered in extremely small doses, it is not surprising that the idea that the thyroid gland had any importance at all in the economy was scouted, and that very absurd opinions were formulated to explain its existence and presence in the neck.

The first great step from this state of disregard was the discovery by Schiff in 1859 that the organ was important to life, but unfortunately his experiments attracted no attention, and as they were performed with a different object than the direct investigation of the function of the organ, the result was obscured.

However, the question was re-opened by Schiff scientifically in 1884, and then placed upon an accurate basis, since he definitely proved, for the first time, that the removal of the organ alone was attended in the carnivora by striking symptoms preceding a fatal termination. At the same time, Reverdin and Kocher had established the fact that total removal of goitres was liable to be followed by certain symptoms which, from the description, were recognised by Semon to be analogous to myxœdema, and it was on Semon's drawing attention to this matter that the Committee of the Clinical Society was appointed for the purpose of collecting what information was in existence relative to the disease myxœdema, which had been for some time well recognised in this country.

Up to this point, however, the final proof was wanting that the fatal symptoms of thyroid extirpation were due to the actual loss of the thyroid gland, and no proof existed of the loss of the gland being the cause of myxœdema and cretinism. The reason was that the experiments so far had been conducted for the most part on carnivorous animals, in which the gland is of such essential importance to life that removal of it is followed by an extremely acute cachexia, customarily fatal in a very few days. Such a class of animals consequently did not afford means for the determination of the rôle played by the gland in a disease which runs such an extremely chronic course as that of myxœdema. To really test the question, therefore, attention had to be turned

to the possibility of removing the thyroid gland in classes of animals in which the progress of the malady might be supposed to be slower. It was for this reason I undertook an experimental investigation into the question, employing monkeys for this purpose, and, later, herbivorous animals, strictly speaking.

The result was to establish beyond question the fact that the typical symptoms of myxœdema could be produced in a monkey by simple removal of the thyroid gland, and the synchronous examination of the other structures of the neck, *e.g.*, the nerves, proved also that no injury was done to them, and that therefore the symptoms were solely and wholly due to the loss of the gland itself. In speaking of this fundamental position it was forcibly brought to my notice in 1884 how a medical theory of the explanation of disease may survive without any basis whatever for nearly a century.

On the first occasion on which I showed, at a meeting of the Pathological Society, one of the monkeys which had died from myxœdema, thus produced, a distinguished pathologist took great exception to my assertions that the symptoms were due to the loss of the gland, and stated that in his opinion myxœdema was due to changes in the sympathetic nerve.

Now this was really an evidence that the sympathetic theory of disease which Abernethy was at such pains to establish against the experimental methods of John Hunter was still prevalent in the minds of many, and more than that, when my observations were severely attacked by Professor Munk in Berlin, it was wholly upon the assumption that the sympathetic and other nerves in the neck had been injured during the operation of ablation of the gland. Of course, as a matter of fact, Schiff had already shown, in the carnivorous animal, that in that class at least the fulminating symptoms observed were not due to injury of any nerve in the neck, and I also naturally examined both the sympathetic and vagus trunks in the monkeys operated upon, and with wholly negative results.

It is very difficult to understand how such a theory as that of the influence of the sympathetic nerve and its supposed ability to produce constitutional disease can ever have found a serious position in medical literature and work.

Long after it was started, the discovery of the influence of the vasomotor system was additionally invoked to explain obscure

general symptoms like those of myxœdema, and there was of course some basis for such an opinion, in view of the fact that so many of the vasomotor fibres run in the sympathetic trunk, but the fact always seemed to have been lost sight of, that in a general constitutional affection there must be some profound chemical change, and while we must be ready to admit that the chemical changes of the body are greatly under the influence of the nervous system, still it will always remain an inexplicable absurdity that one set of nerve fibres should have ever been accredited with the power of producing a widespread disturbance of metabolism.

Of the general character of the athyroideal state, few proofs are more striking than the researches of Hoffmeister and V. Eisselsberg in producing artificial cretinism in young animals by excising the thyroid directly after birth. These photographs show the animals and the changes in the epiphysical ends of their bones, and which latter led to the mischief being termed by Eberth and others fœtal rickets.

But final destruction of the sympathetic theory has now been given by the brilliant demonstration by Dr. George Murray that the terrible and fatal symptoms which, chiefly by the clinical researches of Dr. Ord, we are all so familiar with can be dissipated by the internal administration of that structure, the loss of which had caused the disease.

We will now commence the discussion of the special points in the functional activity of the thyroid gland to which I wish to draw your attention to-night.

Since 1891 the microscopic morphology of the thyroid gland has undergone much and interesting extension.

The experimental researches of Gley have attracted renewed attention to the organs originally discovered by Sandström, and independently observed by Baber, and the existence of which has been subsequently confirmed by a large number of observers from myself in 1884, to Kohn in 1895.

The relation of the parathyroid to the lateral lobe of the thyroid has been shown by Prenant to be in the sheep's embryo a distinct outgrowth of the wall of the thyroid vesicular entodermal prolongation. In Prenant's figure, it is plain that the parathyroid develops in chronological advance of the thyroid itself, and by reason of its position, lies near the hilum of the lateral lobe. At

the same age of development must be noted also the proximity of the upper part of the thymus.

The involvement of the parathyroid in the carnivorous animal in the thyroid has been investigated most recently by Kohn, and he describes two masses of parathyroid tissue as external and internal gland, one in the hilum, the other at the opposite or outer surface.

In this microscopic dissection of the neck of a cat killed by bleeding, the external parathyroid is well seen on the surface, and in these sections from the dog both external and internal masses are obvious.

The structure of the parathyroid has always been looked upon as embryonic thyroid tissue, but in addition to the point just mentioned of its early development, it needs to be pointed out that it resembles the supra-renal body and the carotid gland so-called, which must be looked upon as adult tissues.

In structure, it seems to be made up of columns of ectodermal epithelium cells, separated by capillaries, and in places the groupings of the columns of cells around a capillary suggests the grouping observed by Arnold in the supra-renal body and held by him to be characteristic of a glandular and secretory mechanism. This I found, in 1885 and 1886, to be specially observable in the parathyroid, in cases of compensatory hypertrophy in dogs, but as Edmunds has shown in his recent valuable paper, no true acini are found and no colloid secretion collected. The gross enlargement of the parathyroid in compensatory enlargement hypertrophy observed by me has been confirmed by Edmunds, and is shown in these photographs.

As regards the minuter structure of the parathyroid, the accompanying photographs exhibit the features dwelt upon chiefly by D. Sandström, Kohn, and Edmunds. In the monkey the capillaries are numerous and often dilated, the cells small, and packed together, but a more interesting point is the similarity demonstrated by Wolfler and Edmunds between embryonic thyroid or adult parathyroid tissue, and the tissue of many so-called adenomatous goitres. Contrast these photographs from specimens from the cat, and from an adenoma I removed by operation.

A word with regard to the vascular supply of the parathyroid. This beautiful injected specimen, for which I have to thank Dr. Gustav Mann of Oxford, affords the opportunity of comparing

the vessels in the thyroid, parathyroid, and a lymph gland in the cat. The relative diminishing vascularity is well marked and the vessels perpendicularly arranged at the margin of the parathyroid, clearly exhibited as in the supra-renal body. In the two further photographs illustrative of the vascular secretory apparatus of the thyroid, Dr. Worrall has succeeded in obtaining a striking picture of even the opaquely injected vessels of the thyroid gland as seen by reflected light. There is, therefore, on consideration of the anatomical facts of the normal and hypertrophied parathyroid gland structure, enough to suggest a basis for confirmation of the position first established by Gley, by physiological experiment, namely, that the parathyroid is a gland *sui generis*, and has a specific function related to that of the thyroid gland.

There is a further point concerning the morphology of the thyroid gland worth a moment's notice. In 1884 I drew attention to the existence of tissue resembling lymphoid tissue in the thyroid gland, and suggested that it might have some relation to the anæmia observed to be produced by removal of the gland, and that, therefore, the influence of the organ in hæmapoiesis might be direct as well as indirect. Exception was taken to my statements, but they have been now fully confirmed both by Kohn and Abrami, as is shown in these photographs.

Kohn, in fact, adopting the line taken by Prenant, calls the adenoid tissue the inner thymus; but the exact relations of this to the other portions of thymus tissue in the neck, notably that on the outer and anterior aspect of the carotid artery, has yet to be determined.

Now that we know for certain that the thyroid gland is a secreting gland which has a very important relation to the metabolism of the body, we can re-examine the epithelium of the acini with a fresh interest. I will first direct your attention to the compensatory hypertrophy of one lobe when the other has been removed, an hypertrophy which both Wagner and myself independently have shown in the dog and cat is a true compensatory hypertrophy. The most remarkable changes are to be observed in the epithelium of the acini, as well as in the nature of the contents of these cavities. Further, the normal epithelium of the acini, the groundwork of the study of which was first laid in this country by Dr. Cresswell Baber's well-known monographs,

and its behaviour when both lobes of the gland, or only a part, are in full functional activity, has been the subject of special study in relation to the problems of secretion by Langendorff, Hurthle, Neumeister, Anderson.

Langendorff pointed out that the well-known cubical epithelium consists of cells of two distinct kinds, which have a different staining reaction and one of which appears to have characters suggesting the formation of the colloid material within the cell. If we first turn to the compensatory hypertrophy we learn a number of striking facts, and the first change to be noted is that the epithelium alters, instead of remaining cubical, the individual cells tend to grow out and become columnar. In the second place the outline of the acinus alters instead of being a more or a less rounded cavity, it becomes a cavity resembling the branching of an ordinary gland; in short, it is rather more a conglomeration of tubules than a collection of cystic spaces.

This metamorphosis of the ordinary acinus proceeds so far, that in a well-marked case the lumina of the acini are greatly encroached upon, and in many cases are obliterated by the taller epithelium of the two sides coming into contact. Finally the secretion of the acini, from presenting the appearance of ordinary coagulated but semi-translucent proteid, becomes replaced by less solid, *i.e.*, more watery contents, and ultimately its solid constituents are represented by a granular débris and the original colloid material disappears.

This compensatory hypertrophy will be recognised by all present to be parallel to what we observe clinically in a human being under circumstances of parenchymatous enlargement, thus in the so-called parenchymatous goitre the acini are not enlarged, but their outlines become irregular, and the epithelium increases in height. But the most remarkable similarity, and one I drew attention to in 1884 ('Brown Lectures') in the conditions I observed in hypertrophy, was that seen in exophthalmic goitre.

In exophthalmic goitre the acini become more irregular and more resemble a racemose gland; the colloid material tends to disappear, and is represented by a granular débris; this is coupled with a general enlargement of the whole gland, just as in the artificial hypertrophic compensation. In the extreme case of which I show you specimens the secretion was a thin, watery fluid. It is hardly possible to leave the point of exophthalmic

goitre without a few further observations. On the question of the symptomatology of exophthalmic goitre I showed, in 1884, that the tremor present in all forms of thyroidal lesions was exactly the same as the tremor of acute cachexia strumipriva of thyroidectomised animals, and the fact was subsequently recognised by Charcot and Marie. But the problem of chief moment in the pathology of exophthalmic goitre is the question whether the anatomical changes we have just seen have a causal influence or are only a secondary consequence of some central nerve lesion. As yet the nerve supply of the gland shown in these photographs has not been demonstrated physiologically (*i.e.*, by excitation, &c.) to exert secretory influence comparable to the well-known effects on the salivary glands. The question has therefore been approached from a clinical standpoint, and in the suggestive papers by Maude and by Abram we have a reflection of the recent tendency to regard the symptoms as being due to perversion of the secretion of the gland, the changes in which therefore come to have a primary significance. It is plain that the symptoms are also explicable as being athyroidal, and I venture to suggest that where there is extensive perversion of secretion that so in proportion there must be a certain degree of athyroidism. Take a single symptom, such as the characteristic dyspnœa. That again is exactly the most prominent symptom of the acute athyroidal cachexia in all kinds of animals. Coupled with the dyspnœa is not unfrequently a rise in temperature, and in cases where death has rapidly supervened after removal of one portion of an exophthalmic goitre the temperature may rise to 105° or higher and the patient die with marked dyspnœa, although, of course, there is no mechanical interference with the air passages. I have quite recently had the misfortune at University College Hospital of seeing the same condition occur in a patient who was the subject of a very large parenchymatous goitre affecting the whole gland. The dyspnœa was considered to be due to the flattening of the trachea from the pressure of so large a tumour, and, though the flattening was found at the operation, I regret to say it did not occur to me that the severity of the dyspnœa might have been in part due to the patient having been in a certain stage of athyroideal cachexia which had been brought about by the involvement of the whole organ in the disease change.

Removal of the tumour, although in this case particularly easily accomplished, did not terminate the dyspnœa, to which the patient succumbed, and at the autopsy the two-thirds of the left lateral lobe left behind for carrying on the function of the gland were found to be extensively goitrous. In future I shall treat such patients with thyroid prior to undertaking the operation.

We may now return to the secretory epithelium and the colloidal and other products of its secretory activity. Very interesting and valuable observations on this point have been made by Anderson and others who, following on the line initiated by Von Wyss, have administered pilocarpin with the effect of obtaining heightened secretory activity on the part of the epithelium. As regards the changes in the epithelium, a great deal has been said by many observers as to the vacuolation of the epithelium and the appearances of vacuolation in the colloidal substance. In the most recent work on this subject, that by Anderson, these vacuoles containing secretion are supposed by him to move out from the epithelial cells and to migrate into the centre of the acinus. It seems unnecessary to do more than remark on this point that the secretion is supposed by many to collect as watery droplets, which, naturally, appear as vacuoles in the substance of the gland, and, of course, such secretion is simply extruded from the secreting cell, therefore, the view of Anderson is so far coincident with prevailing views. In speaking of the question of the vacuolation of cells, especially in relation to the thyroid gland, I wish to draw attention to the vacuolation, not of the mere protoplasm of the fat cells in myxœdema, which is in itself a common, in fact regular, state of things, but to the vacuolation of the nuclei of the fat cells, and which I believed to be a fairly constant phenomenon in myxœdema. I first observed it in 1885, but could not find any reference in the literature of that time to the matter, and subsequently Professor Boyce and Mr. Beadles independently observed the fact in a case of myxœdema published by them in 1894.

Since then the question of the vacuolation of the nuclei of fat cells in general has been very thoroughly investigated by Sack, who goes much further and finds that vacuolation of the nuclei of fat cells occurs not only in the diseased tissues, viz., lipomata, but also normal developing fat and in fat undergoing senile

degeneration. It is obvious, therefore, that vacuolation of the nuclei of the fat cells, although a very interesting biological condition, is not peculiar to myxœdema, and consequently cannot be regarded as pathognomonic of that disease change.

A photograph from Sack's monograph shows vacuolation of the nuclei not only of the subcutaneous fat in man, but also in large nuclei of the Salamander. The so-called vacuoles in the colloid substance I have referred to, and must now illustrate more fully, are of far less biological interest and significance. They can be observed in all possible conditions of the epithelium, provided that the latter is capable of forming a colloidal secretion at all. Starting with a pilocarpin result by Anderson, we see actually in vacuolated spaces in the deeply-stained colloid material shed epithelial cells containing droplets and granules of colloidal secretion. In this section of an adenoma removed by opening a large vacuole, the secretion contains numerous droplets of a different chemical constitution.

In another you see solid and granular secretion in neighbouring acini and in another in even the same acinus. In another adenoma with flattened epithelium the colloid is little different as regards degree or vacuolation from this photograph by Hurthle, where the epithelium is heaped up.

In conclusion, I wish for the opportunity of saying a further word on the retrogression of thyroidal epithelium.

In myxœdema, as is now well known, the thyroid gland atrophies, and there is found a round celled infiltration of the remnants of the lobes and acini. This photograph, taken from a patient who died from myxœdema nine years ago, and this photograph of Mr. Lapidge's drawing of another section from the same specimen, show that in retrogression the cells resemble more particularly the parenchyma cells of Baber, that they are polyangular, and that they occupy the lumen of the shrunken acinus, in which there is consequently no secretion. But it is to be observed that this confirms the importance of the morphological change in the epithelial cell. By way of contrast, compare the myxœdematous retrograded cell with that of the compensating active transplanted thyroid in one of V. Eisselsberg's striking experiments.

In this last there is no colloid and the secretion must have been a watery one, yet adequate.

Estimation of the athyroidal condition therefore is rather to be looked for as yet in the changes in the epithelium itself than in the products of its secretory activity.

To summarise our present position and knowledge of this whole question, it is, I think, now generally agreed (and the more so since the recent researches of Mr. Edmunds) that whereas myxœdema and cretinism result from simple loss of the function of the thyroid gland, exophthalmic goitre in its various degrees results from a perversion of that function.

Sir WILLIAM ROBERTS proposed, and Dr. MITCHELL BRUCE seconded, a cordial vote of thanks to Professor VICTOR HORSLEY for his admirable lecture and lantern demonstration. The vote was carried by acclamation and Professor Victor Horsley briefly returned thanks.

March 23rd, 1896.

FOUR CASES OF EARLY EXTRA-UTERINE GESTATION.

By ALBAN DORAN, F.R.C.S. ENG.

ABOUT a year ago within the space of four months I had under my care four patients who consulted me for symptoms now very familiar to the reader of medical literature. These cases suggest a consideration of certain diagnostic features and of the justifiability of operative interference. The latter greatly depends upon the former. One case clearly required immediate operation. The second was in such suffering that surgical aid was sought and proved justifiable. The third was in a somewhat similar condition, but the patient was single, the clinical history not quite reliable, and the symptoms obscure in certain respects. The operation was, strictly speaking, exploratory. The fourth, which resembled the others in many ways, showed no acute symptoms and recovered after prolonged rest without any operation.

CASE 1.—The patient, aged 25 years, had been married three years, and had borne one child eighteen months before operation. The periods had been regular, the last occurring fourteen weeks before the removal

of the fœtus. For two months several violent attacks of pain and syncope had occurred. Dr. Hubert Roberts detected a very tender swelling in the right iliac fossa pushing the uterus upwards and to the left. The patient was admitted into the Samaritan Free Hospital under Dr. Boulton. A characteristic seizure took place one night, and as she was very pale and weak I decided on operating at once, being assisted by Dr. Hubert Roberts and Dr. Walter Tate. After clearing away a quantity of clot and liquid blood I came upon a ruptured cyst bleeding very freely. A fœtus five and a half inches in length protruded from the rupture. (Fig. 1.) I succeeded in making a pedicle between the right side of the uterus and the cyst, which was then removed. It had developed in the infundibulum of the tube. I cleared out all free clots, leaving alone the half-organised coagula, which adhered firmly to the

FIG. 1.

Tubal sac, Case 1, showing position of fœtus. (Specimen now in the Museum of the Royal College of Surgeons of England, No.4695 G, Pathological Series.)

peritoneum, and closed the abdominal wound. The patient was suffering at the time from acute bronchitis, which retarded convalescence. At present, 11 months after the operation, she is in good health.

CASE 2.—The second patient was a thin, sallow woman, aged 40 years. She had been married 14 years, her only pregnancy occurring a year after marriage. Usually quite regular, she missed a period, and three weeks later the right iliac fossa became tender. Two days afterwards a very severe attack of pain, with pallor and collapse, set in and radiated down the front of the thigh. Called in by Mr. Nourse, of Holloway, to examine her, I detected a distinct tender swelling in the right fornix. After a week's rest, several more paroxysmal attacks occurred, suspicious shreddy structures were passed from the uterus, and the swelling grew larger. The temperature rose to 100·8° F. The breasts

were flaccid. I operated on March 23rd, 1895, exactly a calendar month after the first attack of pain. The patient had grown very weak from the pain, but was not distinctly anæmic. I found several ounces of dark blood in the pelvis. A spherical sac of the isthmus of the tube, $2\frac{1}{2}$ inches in diameter, was plainly adherent to the small intestine and the vermiform appendix. On separating the adhesions I exposed a laceration in the upper part of the sac, which at once bled very freely. The inflammatory changes had stopped the hæmorrhage. The affected tube and ovary were removed. I cleared the pelvis of clots and closed the abdominal wound. The period reappeared on the fortieth day after the operation, and the patient, who has gained flesh, has been regular ever since. Though no fœtus was found, the microscope confirmed my suspicions that there had been ectopic gestation. (See Figs. 3 and 4.)

Case 3.—I am indebted for the third case to Dr. Rasch. She was a naturally anæmic Polish Jewess, aged 18 years, and unmarried. After suffering cruel privations from sudden expulsion from the Russian Empire she settled in the East End with her mother, who one night scolded her for coming home late, and expressed suspicion about her conduct. The girl flew into a passion and stamped on the ground, upon which a paroxysm of intense pelvic pain set in. Another attack came on a few days later with a show of blood, which she believed, or wanted others to believe, to be a period. Dr. Rasch discovered a painful swelling in the right iliac fossa. A free show of blood began about a month after the first attack of pain. Rest was of no avail. I operated on January 8th, 1895. After separating the adherent omentum, small intestine, and vermiform appendix, I drew up a cyst of the infundibular part of the right tube full of tarry blood and about three inches in diameter. The rest of the operation was easy; a good pedicle could be made as there was over half an inch of tube internal to its fœtal sac. I broke down the adhesions which bound down the left appendages and closed the abdominal wound. The patient soon regained health. A well-marked chorionic villus was found in the clot adherent to the wall of the sac. (Fig. 2.)

Case 4.—This case recovered without any operative interference. The patient, aged 34 years, had been married 13 years. Since her only pregnancy, 10 years ago, she suffered from frequent attacks of pelvic pain and had been laid up twice in the last two years. The catamenia suddenly ceased, and when two weeks overdue a paroxysm of pelvic pain set in with nausea and retching. On the second day a coffee-coloured discharge appeared and continued for six weeks; then Dr. Walter Tate examined her and noted:—"Cervix forward; body of uterus pushed forward $2\frac{3}{4}$ inches. Firm, elastic swelling fills up the right side of the pelvic and posterior part and extends to the level of the umbilicus. Harder and more nodular on the left side." Two days later the patient felt the menstrual molimen and the show increased. Next day Dr. Tate sent her into the hospital as the swelling was increasing. I found the patient to be fairly nourished; the breasts were flaccid. The tumour was as above described by my colleague and it extended down to the left fornix. As no second paroxysm of acute pain had occurred I kept the patient in bed for three weeks. At the end of that period the mass had become much smaller and harder; it was clearly a hæmatocele. Dr. Tate

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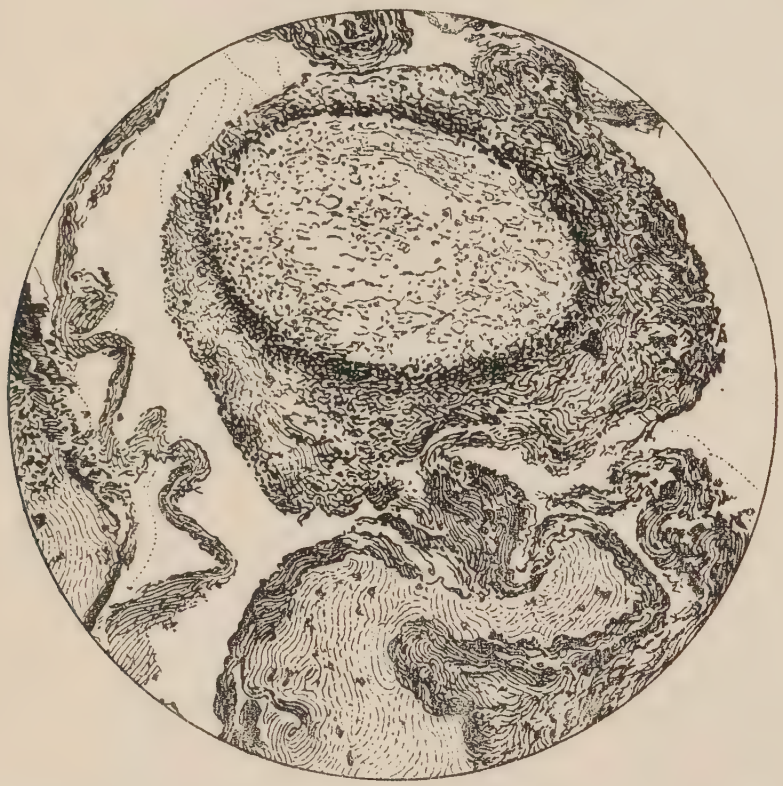
Cases of Early Extra-uterine Pregnancy.

No. of case.	Age.	Married or single.	Children and last confinement.	Catamenia and state of breasts.	Last period.	Hæmorrhage apparently not connected with period.	Decidua.	Symptoms, besides menstrual irregularities or hæmorrhages.	Condition discovered at operation.	Catamenia after operation.
1	25	Married (3 years).	1 (18 months); no abortion.	Catamenia previously regular. Breasts full; nipples prominent.	14 weeks before operation; normal.	Occasional spot or two of blood. A month before operation blood and matter came away (probably from rectum — operation for fistula 2 years before).	Nothing like decidua ever detected.	Several attacks of pain within last 2 months; pain and syncope 1 week, then tender swelling in right iliac fossa, rising above symphysis; acute attack of pain with anæmia and syncope, when operation was performed.	Ruptured cyst of infundibulum of right tube. Peritoneal cavity full of clots. Cyst removed, left appendages normal.	Reappeared 4th day after operation; again 32 days after operation; regular for last 8 months.
2	40	Married (14 years).	1 (13 years); no abortion.	Catamenia regular. No changes in breasts.	11 weeks before operation; profuse not very painful.	"Show" 16 and 8 days before operation.	Shreddy structures, mixed with recent clot, passed 8 days before operation.	Violent pain in right iliac fossa (preceded by 2 days of local tenderness) a month before operation, pallor, collapse, swelling in right fornix, frequent paroxysmal attacks with faintness, fever, &c.; emaciation; anæmia not marked.	Pelvis contained dark blood. Cyst of isthmus of right tube ruptured; laceration closed in by firm adhesions to intestines and vermiform appendix. Removed.	Reappeared on the 40th day after operation. Regular ever since.
3	18	Single.	No evidence of former pregnancy.	Catamenia very regular. No changes in breasts.	1 month before operation; profuse "show" (see next column).	Uterine hæmorrhage twice in the 2 months before operation (Patient's statements not reliable.)	Nothing like decidua detected.	2 months before operation sudden attack of severe pain in pelvis following a fit of passion; tumour developed in right iliac fossa; marked anæmia, but of long standing.	Thin-walled tubal cyst full of tarry blood in infundibulum of right tube. Omentum, vermiform appendix, and coils of small intestine adhered. Cyst removed. Chorionic villi found in clot.	Reappeared 6 weeks after operation. Continues regular 1 year after operation.
4	34	Married (13 years).	1 (10 years); no abortion.	Catamenia regular, but scanty. Breasts flaccid.	2 weeks overdue when acute symptoms set in.	Coffee-coloured discharge for 6 weeks.	Nothing like decidua detected.	Pelvic pains 10 years (since sole confinement); acute attacks twice in last 2 years: severe pelvic pain, nausea, and retching came on suddenly when the catamenia were 2 weeks overdue; coffee-coloured discharge began next day; firm elastic swelling on right side of pelvis, reaching to umbilicus; uterus $2\frac{1}{2}$ in., pushed forwards and upwards.	No operation. After 3 weeks' rest in bed the swelling became very much smaller; 8 months later it was not larger than an egg, and patient was perfectly well.	(No operation.) Quite regular since subsidence of swelling.

watched the patient carefully. Eight months later he reported that "the tumour had become almost entirely absorbed. It was not larger than an egg and the patient was perfectly well."

Remarks.—These cases tend to show that sudden attacks of pain associated with the development of a mass on one side of the uterus are the most characteristic symptoms of early ectopic gestation. The signs of normal pregnancy may be absent. Amenorrhœa is

FIG. 2.



Chorionic villus in clot adherent to wall of tube, Case 3. The dark border represents the trophoblast.

very unreliable, nor must we forget that menstruation may continue during normal pregnancy. The period had ceased in Case 1, which was so perfectly clear. In Case 2 it had ceased 11 weeks, but there was "show"; in Case 4 there was a continuous coffee-coloured discharge for six weeks. In these two latter cases the patients were intelligent and based their statements on the absence (Case 2) or presence (Case 4) of the menstrual molimen. We know, however, that this purely subjective symptom may mislead multiparæ. In Case 3 the patient's veracity was doubtful. In Case 1 alone was there any tendency to the changes in

the breasts which are characteristic of pregnancy. The remainder were all more or less sickly. On the other hand, a trace of evolutionary change in the mammæ may remain for months or years after lactation, and the development of pelvic or even abdominal disease may set up fulness in the glands. In December, 1895, I examined a young woman who had a large abdominal tumour. One breast was distended and milky fluid issued from the nipple. The urine was normal. I explored and removed a large tumour of the right kidney. The uterus showed no sign of pregnancy. The breasts are, then, an uncertain guide in early ectopic gestation. The decidua is a valuable bit of evidence if it be shed, detected, and preserved. Pilliet* has recently shown that in early ectopic gestation it is not smaller, but, on the contrary, much more developed than in normal pregnancy. In Case 2 suspicious shreddy structures were expelled after one attack of pain; in others the decidua was either not shed or escaped unnoticed. In Case 2 the last pregnancy occurred 13 years before, and in Case 4, 10 years before the abnormal gestation, but in Case 1 the patient had a child 18 months old, whilst in Case 3 the patient was only 18 years of age and probably a primipara. The previous histories are just as conflicting in respect to pelvic inflammation, from which Case 4 had suffered for 10 years, whilst Case 2 had been perfectly well during her 13 years of sterility. Case 1 seems to have been free from this complication, and Case 3 was very ill after expulsion from Russia. Acute anæmia was marked in the self-evident Case 1. Case 3 was extremely anæmic, but through constitutional causes, and the hæmorrhage was confined to the interior of the sac. In Case 2 the pallor was marked at every paroxysm of pain and passed off soon, to be replaced by sallowness. In short, it was the pallor of pain. In Case 4 there was no pallor, though there was evidence of extensive hæmorrhage. On the other hand, there was a history in all of one or more violent attacks of pain. The cause, in ectopic gestation, of this paroxysmal agony is an interesting subject, but it cannot be discussed at present. In Cases 1 and 2 the attack frequently recurred. In Case 3 there was only one fit of severe pain, which directly followed a fit of violent passion; no doubt hæmorrhage into the sac occurred then.

* Études Histologiques des Modifications de l'Utérus dans la Grossesse Tubaire.—Annales de Gynécologie et d'Obstétrique, vol. xliv, 1895, p. 241.

The dull pain which followed and increased was clearly due to the peritonitis which developed around the sac. The microscope settled the nature of the tubal swelling. From the first three cases we can fairly assume that extra-uterine pregnancy existed in Case 4. Severe pelvic pain, nausea, and retching came on in association with previous menstrual irregularity and subsequent uterine hæmorrhage and development of a hæmatocele. When an operation has been performed, the diagnosis may remain uncertain, for the fœtus is often destroyed by the internal hæmorrhages. The clot and tubal wall should always be examined by a competent observer. I must thank Dr. Eden and Mr. Targett for

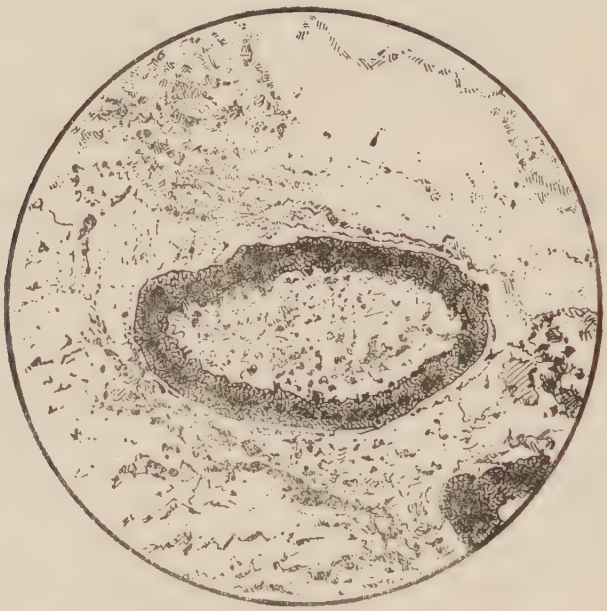
FIG. 3.

Chorionic villi in clot adherent to the wall of tube, Case 2. (Half an inch objective.)

their opinions on my specimens. In the sections from Case 1 the villi were well developed and were eating through the thin sac wall, as often happens after the first two months. No traces of decidua remained. In Case 2 no fœtus was found, but the appearances of the sections were absolutely pathognomonic. In the photo-micrographs which are here reproduced (they were taken by Mr. Roughton and Mr. Cosens) the chorionic villi are very evident. (Figs. 3 and 4.) The trophoblast layer, nucleated yet not divided into cells, shows very clearly. Dr. Eden detected large, round, decidual cells in an involution of the tubal wall. As the ostium was not closed, there possibly might have been tubal

abortion at an early stage, with subsequent hæmorrhage into the sac. In conclusion, it seems that operative interference is always called for when acute symptoms are present, especially if they have recurred. The chances of permanent subsidence of the pain and that which causes it are less than the risk of fatal hæmorrhage or complications very prejudicial to health. Thus an operation is less perilous than expectant treatment. When, on the other hand,

Fig. 4.



One of the villi seen in Fig. 3, one-eighth of an inch objective. The trophoblast is very well developed.

we can obtain, as in Case 4, a history of steady subsidence of pain and swelling for weeks after a single acute attack, it is our duty to trust to rest, at the same time keeping a vigilant watch on the patient. Spontaneous recovery is then highly probable.

TEN CASES OF OPERATION FOR EXTRA-UTERINE FŒTATION.

By Harrison Cripps, F.R.C.S.

It has not yet been established that extra-uterine fœtation commences anywhere except in some portion of the Fallopian tube. By bearing in mind the relation of this structure to the broad ligament it will be understood how different the conditions will be according as to whether the fœtal sac as it grows protrudes

upwards or downwards. If upwards, it will protrude like a sacculated aneurysm into the abdominal cavity; if downwards, it will extend between the layers of the broad ligament, separating them widely. When rupture takes place through the free surface of the sac there is nothing to arrest the hæmorrhage, and a large number of cases bleed to death in a few hours. On the other hand, when the blood is poured downwards between the layers of the broad ligament it will spontaneously cease, as these can only be detached to a limited extent. In a large number of these latter cases the extravasated blood ultimately becomes absorbed and the patient recovers. There is, however, a third condition, and which is probably more common than either of the other two (see Cases 3 and 5), in which a ruptured tube pours out blood in such a way that it becomes encysted in Douglas's pouch. In these cases a mass of coagulated blood forms a tumour the size of a cocoanut, bounded below and at the sides by Douglas's pouch, and above by the dilated tube, small intestine, and free end of the omentum bound together by inflammation and plastered over the roof of the pelvis. The probable explanation of these intra-peritoneal circumscribed collections is that some localised peritonitis is set up in the first place by a slight oozing or irritation, and thus the general cavity of the peritoneum is shut off before any extensive pouring out of blood occurs.

Without recapitulating all the well-known symptoms which are so diagnostic of ruptured extra-uterine pregnancies, it may be worth while to mention some of the chief points in the differential diagnosis between rupture occurring free into the peritoneal cavity, or when it occurs between the layers of the broad ligament, or when circumscribed in Douglas's pouch, for the whole question of operative treatment depends upon the position of the rupture.

When the sac bursts into the peritoneum, pain, though severe, is not so intense as when the bleeding is into the broad ligament. On the other hand, the general symptoms are graver, doubtless due to a larger amount of blood being lost. Indeed, the hæmorrhage may be so profuse, that within an hour or two of the accident the patient may be pulseless, and almost moribund, but as a rule she will rally to a certain extent from the immediate effects of the first loss of blood, thus affording time for surgical interference, which, to be effective, must be prompt, the cases being almost invariably fatal if the bleeding is not arrested by

abdominal section. The general symptoms of shock such as are produced by loss of blood from any part are most marked. The abdomen is tender; it is resonant in front, and often there is considerable impairment of resonance, or even dulness in the flanks. Careful palpation of the abdomen fails to detect any obvious tumour. On making a vaginal examination the uterus is movable, and in the natural position. No tumour can be felt, but there may be some fulness in Douglas's pouch conveying a doughy feeling to the finger, doubtless due to blood-clot. Examination of the rectum shows no stricture of the bowel.

If the rupture has occurred between the layers of the broad ligament the sudden onset of the symptoms will be the same, but the pain seems to be more intense and lasting, with a well-marked paroxysmal character described by patients as like labour pains. The patient generally shows signs of hæmorrhage, though in a much less degree than in the intra-peritoneal cases. On deep abdominal palpation a tumour feeling hard may be found in one or other side rising out of the pelvis, though not to a great extent. Sometimes the swelling does not rise sufficiently to be obvious on abdominal examination. It is on examining by the vagina, however, that the more important points in the differential diagnosis are to be obtained, for in intra-peritoneal rupture there is nothing abnormal to be felt, save perhaps the puffy swelling already alluded to in Douglas's pouch, whereas, in the broad ligament variety a hard swelling can be felt on one or other side of the cervix partly filling the pelvic cavity. The tumour is firmly fixed, while the uterus pushed to one side appears to form the inner boundary of the swelling, and is attached to it. On examining the rectum a marked constriction is often present at about 4 inches from the anus; this is due to the rectal fascia, which passes round the bowel and is continuous with some of the broad ligament fibres. Hence, if the broad ligament is pulled upon, as it is when distended by an effusion between its layers, the rectal fascia becomes drawn tighter, producing a ring-like stricture.

Diagnosis when the Rupture is into Douglas's Pouch.

I believe this to be, perhaps, the commonest form of rupture, and I have certainly met several instances of it. In these cases, owing to a slight oozing, which at first takes place, and which is

the probable cause of the localised peritonitis which ultimately limits the effusion, there may be an absence of the sudden acute pain followed by collapse which is so characteristic of the other two varieties of rupture already mentioned. The general history suggestive of a pregnancy may be present, together with some pain, though not of an acute nature, about the pelvis. An examination *per vaginam* discloses a swelling, perhaps the size of a cocoa-nut, and this lies behind the uterus in Douglas's pouch. The swelling is elastic, feeling like an ovarian cyst, for which it is, indeed, generally mistaken.

In the cases in which I had an opportunity of making a thorough examination the swelling did not feel nearly as hard as if the blood had been in the broad ligament. The swelling, too, chiefly occupies the middle line rather than one side or the other. The uterus, although its mobility is impaired, is not so firmly fixed as in the broad ligament cases, and there is no stricture of the rectum.

Question of Operation in Ruptured Extra-uterine Fœtation.

This must be considered, first, in those cases where the rupture has been intraperitoneal, and, secondly, where it has ruptured into the broad ligament or in which it is limited to Douglas's pouch.

Rupture into the Peritoneal Cavity.

If left alone these cases almost invariably die from hæmorrhage, and there can be no question, in the light of modern experience, that directly the condition is recognised the abdominal cavity should be opened, and the bleeding points secured by ligature. In the whole range of abdominal surgery no more brilliant results are obtained than by thus treating a ruptured tube. Without operation, not only is death nearly certain, but it occurs with tragic rapidity. On the other hand, by a prompt operation the large majority of the cases are saved, and in the course of a few weeks restored to perfect health.

Rupture into the Broad Ligament.

When the hæmorrhage is limited to the broad ligament or to Douglas's pouch, a grave question arises as to the propriety of surgical interference.

There can be no doubt that in a large number of cases where the bleeding is into the broad ligament, the patients get perfectly well without interference. The death of the fœtus seems coincident with the hæmorrhage. The bleeding, being limited by the broad ligament, is not sufficient to be fatal, and in the course of a few weeks will disappear by absorption with the recovery of the patient. No doubt, in some of these cases a secondary rupture of the distended broad ligament may occur, and a fatal hæmorrhage thus takes place into the abdomen. Again, it is possible that the fœtus may not be killed, and may go on developing in the broad ligament, while in other cases suppuration, with its consequent troubles, will result from the extravasated clot.

These occurrences, however, seem to be so exceptional that their anticipation does not justify an operation; so that, if there is no evidence of any increase of the swelling, and if the general symptoms do not indicate a continuance of the bleeding, such cases are best left alone, merely keeping the patient absolutely at rest in the recumbent position. On the other hand, if the symptoms of hæmorrhage continue, or if the swelling which may have remained stationary for some days again increases in size with an exacerbation of pain, an operation should be undertaken.

Cases will occur in which, owing to the absence of any indication pointing strongly one way or another, a legitimate doubt must arise as to the propriety of interfering. In these circumstances the surroundings of the patient must be taken into consideration when forming a decision. In a hospital or well-appointed house with sanitary surroundings, a good nurse, and a surgeon accustomed to abdominal sections, I would advise an operation, while without these advantages in a doubtful case it would be wiser to leave things alone.

Hæmorrhage limited to Douglas's Pouch.

There has yet to be considered the propriety of operating where the hæmorrhage is presumed to be into Douglas's pouch, and limited by peritoneal adhesions above, as already described. The diagnosis of such a condition of things must be always uncertain till after the abdominal cavity has been opened. In the two last cases coming under my care the tumour was supposed to be an inflamed ovarian cyst, the true nature of the trouble being only

ascertained at the time of operating. Since the diagnosis must always be doubtful, I should not hesitate to advise an operation. If the diagnosis be wrong, and the swelling prove to be an ovarian cyst, it can only be cured by removal; while if the diagnosis be right, and the swelling prove to be a large hæmatocele in Douglas's pouch, the safest way of dealing with it and preventing secondary complications will be by clearing out the mass. It is true that if left alone blood might be gradually absorbed, but I have seen a case in which its presence has caused the coils of intestine roofing it over to become matted together in a regular ball by dense adhesions which could not fail to be a source of subsequent danger from obstruction.

Operation when the Tube is Ruptured into the Peritoneal Cavity.

This is so simple that much need not be said about it. When the peritoneum is reached from the abdominal incision its dark colour at once shows that blood is beneath it. When opened a large quantity of blood and clot immediately pours out. The left hand passed quickly to the pelvis feels for the uterus, this forming a landmark; the ruptured sac can be at once grasped and drawn upwards, and a pair of long pressure clamps put upon either side of it, to be replaced by ligatures when the blood clot has been removed and a better view obtained.

All danger from further bleeding being over, attention is paid to the removal of the blood clot, which is often collected in enormous quantity in the abdominal cavity. This is best removed by a thorough flushing. A long glass irrigation tube is passed to the bottom of Douglas's pouch, and as the water flows back in a regurgitant stream the left hand is employed in gently moving the intestines so that all clot entangled between their folds is removed. When the water comes back clear from the pelvis the tube should be shifted to the kidney regions, and then below and a little behind the liver; also the pouch between the uterus and the bladder must be remembered. When the water comes back clear the flushing is complete. A long glass tube is passed down to the bottom of Douglas's pouch, and whilst the stitches are being introduced a small indiarubber tube passed down to the bottom of the glass tube is made to act as a siphon, quickly drawing off the

accumulated water. The stitches are now all tightened, the glass tube removed, and the abdomen permanently closed, for I am well satisfied that in most cases further drainage is not required.

Operation when the Rupture is into the Broad Ligament or Limited to Douglas's Pouch.

In these cases considerable caution must be exercised in making the abdominal incision, especially towards the lower angle, for the omentum and intestines may be adherent to the parietal peritoneum in this situation, and thus in danger of being wounded. It is best, therefore, to make a little opening through the parietal peritoneum in the upper angle sufficient to introduce the finger, which can be used as a guide for completing the peritoneal incision. On opening the abdominal cavity in all these cases I have found the condition nearly identical. The omentum is adherent, plastered like a lid over the pelvic contents, the free border being apparently adherent both to the anterior abdominal parietes and to the upper part of the uterus. The first step is to separate this. If at all firmly adherent it is better to trace it up till the free portion is found; it can here be ligatured in segments, the large clamp being placed below the ligatures is cut across. When this has been done the summit of the uterus can be made out. It is adherent behind to some coils of intestine. Upon gently separating these, some black blood suddenly wells up, and a quantity of dark clot can be seen. This blood and clot is sometimes within a sort of cyst lining the interior of Douglas's pouch, or contained between the layers of the broad ligament. In one case (3) I was able to shell out this cyst-like body intact, but it could not be definitely ascertained what structure formed the cyst, whether it was the remains of an expanded tube, or simply the outer surface of the blood clot become firm and fibrinous. In most cases, forming part of the roof of the blood sac, is the thickened remains of the ruptured tube. The blood below is simply bounded by the structures forming Douglas's pouch, the clot being black and soft in the centre, but firmer towards the outer portions where it is adherent to the peritoneal lining of the pouch. The great bulk of the clot can be scooped out with the hand, and the remainder with more or less ease stripped off with the finger tips, or with the gentle use of the spoon. In three of my cases the fœtus was found in this

clot. After the clot has been scooped away as much as possible, the cavity can be well flushed. At this period of the operation, or earlier if it should appear more convenient, the remains of the tube, after being ligatured on either side, can be cut away. The question of employing a drainage tube is rather a nice one. In Cases 2, 3, 5, 6, it was used. Hitherto I have been guided by the condition of the cavity. If all the clot has been well washed away, I do not use it. On the other hand, I have thought it safer to do so where there has been much ragged tissue left behind.

Extra-uterine Fœtation with a Living Fœtus.

Cases in which development goes on till the fœtus quickens are comparatively rare. Out of 14 cases of operation, I have only had one in which the child was alive. The child was between the sixth and seventh month, and the case was the only fatal one in the series.

Treatment.

There seem to be three courses open to the surgeon:—

1. To operate at once, and remove the fœtus.
2. To wait till near the natural time with a view to removing a living child.
3. To wait till the death of the child after its full time.

In deciding the best line of action, some surgeons are influenced not solely by what is safest for the mother, but they also take into consideration the life of the child. Holding in respect the humanity which thus influences some operators, I must confess that my own decision would entirely turn on which course would involve the least risk to the mother's life. In all operations undertaken during the vitality of the fœtus the chief danger is from hæmorrhage which arises from the detachment of the placenta. This may be avoided in some cases by leaving the placenta intact, as will be subsequently discussed. Occasionally the pelvic brim is so plastered over as to make the removal of the fœtus impossible without detaching the placenta.

The rareness of these cases makes it impossible for any single operator to decide from his own experience as to the safest time for undertaking an operation, so that sufficient data upon which to found a decision can only be obtained from the accumulated

experience of many operators. The most recent set of cases to which my attention has been called is that tabulated by Mr. Bland Sutton, whose accurate and careful work can invariably be relied on. Mr. Sutton records 29 cases of operation. In 16 of these laparotomy was performed after the death of the fœtus at about full time. The remaining 13 cases were operated on between the seventh and ninth month, the child being alive. The results are remarkable and instructive. The 16 cases in which the operation was performed after the death of the fœtus all recovered, while in the 13 operated upon whilst the child was alive, eight died. Of the 13 children, only two are mentioned as having lived; the remainder for the most part dying within a few hours.

If further experience confirms these valuable statistics there can be no question as to the relative danger of the two procedures, and that the surgeon, unless untoward complications are present, should defer operation till after the death of the fœtus. Nevertheless he should be prepared to deal with the living child, should necessity arise.

Operation when the Fœtus is Alive.

After opening the abdomen and exposing the fœtal sac, the first question for decision is as to whether or not the placenta should be removed. Undoubtedly one of the chief causes of fatality is the severe hæmorrhage that such a removal entails. It must be remembered that this placental attachment may be widely spread, being plastered on to the intestines or other vital structures, from which it cannot be roughly torn without the risk of damage, or parts of it may be so deeply situated as to be difficult of access. The conditions after its removal are very different to when expelled from the interior of the uterus, for there the uterine contraction at once closes the open sinuses, arresting bleeding. With our present knowledge the best practice appears to be to remove the fœtus, and to divide the cord close to the placenta, leaving this structure intact and untouched. Of course it can be understood that the fœtus might be so situated that it would only be accessible by detaching, or partly detaching, the placenta. In these circumstances the surgeon may be driven, as the only means of arresting the bleeding, to remove the placenta as rapidly as possible, applying sponge or gauze pressure to the denuded surface. Assuming the surgeon has been so fortunate as to remove the fœtus without

exciting any violent placental bleeding, leaving the placenta intact, a further question arises as to what should be done with regard to closing the wound. Dr. Champneys, in his historic case, thought it desirable to bring the cord, which had not been entirely removed, into the lower angle of the wound, and fixed it there. Other operators have cut the cord off short, and put in a drainage tube, while some completely close the abdominal wound without drainage. In the single case fallen to my experience (Case 10) I adopted the latter procedure. The patient died, and from a careful consideration of the conditions found at the *post-mortem* examination, although, of course, it cannot be said that a drainage tube would have saved the patient, it certainly, as matters turned out, would have afforded her a better chance, and, should I meet with a second case under similar circumstances, I should employ drainage.

In my case, after removing the fœtus, it would not have been practicable to draw up the sac, and stitch it to the lower angle of the wound. If this should be possible, it would probably be the best method of treatment, but, failing this, I should pass a drainage tube to the bottom of the sac, and then close the sac as accurately as possible on either side of the tube.

Case 1.—L. J., a married woman, aged 43, three children, last born two years ago, admitted to St. Bartholomew's Hospital, February, 1892. Catamenia regular; last period, middle of August, then amenorrhœa for six weeks. In the beginning of October some pain in the lower abdomen; after that free loss of blood for seven days accompanied with repeated attacks of pain, which made her feel faint and sick. On December 4th, whilst getting up, was suddenly seized with violent pain in the abdomen; this lasted for 13 days, though much less severe than at first. On the 14th she had a second attack similar to the first, and was admitted to the hospital. She was much blanched, with a rapid feeble pulse, and the abdomen considerably distended. *Per vaginam* nothing could be felt except a vague resistance high up. On opening the abdominal cavity a large amount of fluid blood and clot, amounting in all to some pints, poured out. In the right Fallopian tube was a gestation sac the size of a plover's egg. This had ruptured, and there was a bleeding blood clot protruding from its posterior surface through a hole the size of a threepenny piece. The tube was removed, and the abdominal cavity flushed but not drained. Three days later the patient passed a complete cast of the uterine cavity. Ten months after leaving the hospital she was safely delivered of a healthy child. Recovery.

Case 2.—L.P., aged 27, admitted to the hospital November, 1892. She had two children, the last born five years ago. Catamenia regular. Two months ago she suffered severe pain in the abdomen, which recurred about three weeks afterwards. She had been confined to her bed for the last month with almost constant pain, and an intermittent vaginal

hæmorrhagic discharge. On examination, in the right iliac fossa was a marked fluctuating prominence, the cervix was fixed, and all the pelvic excavation occupied by an indurated mass the size of a fœtal head. She remained quiet in the hospital without any increase of the swelling for a month. At that time she was again suddenly seized with pain in the abdomen, and the swelling was found to have considerably increased. On opening the abdomen, the omentum was adherent beneath the incision. On detaching it, its under surface was adherent to the small intestine, and was plastered over the tumour. On separating this, the finger passed into a cavity the size of a large cocoanut full of dark blood clot, apparently of recent origin. Below this and connected with it was a second cavity about the same size which contained a small quantity of recent blood, but was chiefly filled with partially decolourised blood clot. The cavity was obviously intraperitoneal, being bounded above by the omentum and small intestines, in front by the uterus, and below by Douglas's pouch. The ovary and tubes were so densely matted together that their exact position could not be made out. The cavity was washed out, and the adherent blood clot removed by a Volkmann's spoon. A drainage tube was left in, through which during the next few days a large quantity of dark blood-stained fluid was drawn off. On examining the removed blood clot no fœtus could be found, but some membranous substance which appeared to be placental. The patient recovered.

Case 3.—E. C., aged 30, admitted into the hospital, June, 1893. Married eight years, no children. Menstruation commenced at 20, and had always been regular until March 27th last. After that time she had a constant blood-stained discharge for nearly a month. She was then seized during the night with a severe cramp-like pain, the whole abdomen becoming swollen and tender. She had two similar attacks at intervals of a fortnight. On each occasion she became very faint. On admission she looked healthy and the breasts showed no signs of activity; nothing could be felt by the abdomen; *per vaginam* the whole pelvic excavation was occupied by an elastic swelling. She remained at rest in bed for a fortnight; she then had another severe attack of pain and the swelling enlarged. On opening the abdomen the omentum was found glued over the pelvis. On separating this a red vascular-looking tumour appeared. Running over its surface was a greatly-dilated Fallopian tube. The tumour sac was adherent to the rectum behind, and to the bladder and uterus to the right and in front. The adhesions were easily separated by the finger tips and there was considerable bleeding. The finger could then be passed round the cyst, which was lifted up. A broad thick pedicle was obtained, consisting apparently of the thickened tube and a portion of the broad ligament. The cyst was the size of a large fist, and a fœtus 5 inches in length was found lying in Douglas's pouch, probably extruding from the cyst in the process of extraction. After removing the cyst the boundaries of the cavity were clearly seen. Behind was the rectum, in front the posterior surface of the broad ligament, and on the inner side the uterus. Nearly at the bottom of this cavity was a small circular opening going into the rectum obviously produced by softening and ulceration. With great difficulty this was closed with a couple of stitches. A drainage tube was passed to the bottom of the cavity, and, after the flushing, the abdominal wound closed. For over a week gas and small quantities of fæculent matter were drawn up through the tube; but by the tenth day, the fluid having become clear, the drainage was removed. The patient recovered.

Case 4.—A. M., aged 34, admitted to the hospital at the end of January, 1894. She had had five children, the youngest aged only 5 months. After her last confinement she had several rigors. She has had two considerable floodings at intervals of a month. On admission she looked ill, but had a good pulse. Rising to a level with the navel was a smooth swelling; *per vaginam* the whole pelvic excavation was occupied by an elastic tumour, hard in places. The uterus was lying in front and was nearly fixed. The sound passed 3 inches. On opening the abdomen the sac was found lying in Douglas's pouch; it was readily separated and partially drawn up, but the hæmorrhage was so severe than an elastic ligature was slipped as far as possible below the sac. In doing this the cyst ruptured, much dark blood clot extruding; after this it was possible to transfix and tie a broad pedicle. The sac was cut off, the abdomen flushed and closed without drainage. On examination the cyst was thick-walled and covered by peritoneum, and the tube spread over it, the fimbriated extremity being last. When the tumour was cut into it contained blood clot and membrane, chorionic villi being found. The patient recovered.

Case 5.—M. Y., aged 41, admitted November, 1894; ten children, the last ten months previously. Last regular period in August. For some weeks had had an irregular loss of blood. She looked ill, and suffered much pain. *Per vaginam* an elastic tumour was felt behind the uterus. On opening the abdomen a coil of the sigmoid flexure formed the boundary of the tumour. On separating this a sac was found in Douglas's pouch containing about a quart of old and recent blood clot, with some adherent membranous substance found to be placental. All clot and membrane was removed, and a drainage tube used for 14 days. The patient recovered.

Case 6.—E. B., aged 27, admitted November, 1894; three children, the last 13 months previously. Confinements all natural. Last period three months ago, very profuse. Three weeks later flow reappeared, and has continued more or less ever since. At the end of October she had some severe abdominal pain and vomiting, and two or three similar attacks since. A tumour was noticed soon after the first attack of pain. On admission she was very pale and restless; some albumen; breasts inactive. An ill-defined tender tumour was felt, rising high in the left iliac fossa. *Per vaginam* uterus fixed, whole pelvic excavation occupied by a tender, slightly elastic swelling. Operation.—On opening the abdomen the omentum was plastered over the pelvis, and adherent by its free end to the bladder. It was tied and divided. The right tube then came into view. In its centre it was dilated into a hard swelling the size of a bantam's egg. Below and continuous with this was a tumour. Apparently this was between the layers of the broad ligament, and of the size of a cocoanut. On opening this about a couple of pounds of dark black coagula was removed, and the cavity sponged and washed out, a glass drainage tube inserted, and the opened cavity closed around it with silk sutures, and the abdomen closed. The tube was removed on the fourth day. The patient recovered

Case 7.—A. B., aged 36, admitted January, 1895. Married three years, never pregnant; last period six weeks ago. Ten days before admission he was kicked by her husband, which was followed by an attack of

severe abdominal pain. On the day of admission she had a sudden paroxysm of pain whilst walking in the street; she fainted, and was carried to the hospital. On opening the abdomen a large quantity of blood poured out, together with a mass of clot, in which was a fœtus about an inch long. The left tube was found dilated into a sac, which had ruptured in its upper and back part. It was tied and removed. Cavity flushed, but no drainage. On the fourth day the patient had severe symptoms of intestinal obstruction, which, however, were completely relieved by a temporary enterotomy. The patient recovered.

Case 8.—B. Y., aged 31, admitted February, 1895. Three children, the youngest 2 years old. Menstruation regular. A fortnight ago she was struck on the abdomen. This was followed by acute abdominal pain. The pain recurred three days ago, since when she has had frequent vomiting. On admission she looked ill, and was very restless. The abdomen was swollen and tender, both flanks dull. *Per vaginam*, the cervix was pressed against the symphysis. After 10 days in bed all tenderness had gone, and she was about to leave the hospital, when she had another attack of severe pain and vomiting. The abdomen was opened, the omentum was found tacked down to the right side of the pelvis. On cutting this across a large quantity of fresh blood welled up from the pelvis. The right tube was found wrapped up in the omentum, and much thickened, but no recent rent was visible. Douglas's pouch was roughened, and covered with adherent fragments. After flushing, the abdomen was closed without drainage. In the clots was found an ovum the size of a hen's egg. It contained a small cavity lined by a membranous sac, within which was an embryo half an inch long, showing the primary cephalic vesicles.

Case 9.—A. E., aged 29, admitted September, 1895; married 10 years and never pregnant. For the last five months had been irregular, with several attacks of sickness and fainting; lately has passed some offensive blood clots. *Per vaginam*, an irregular elastic swelling was felt behind the uterus. On opening the abdomen a simple broad ligament cyst was shelled out. Douglas's pouch was then found to be full of partly disorganised blood clot, which seemed to have extended from a cavity in the broad ligament. This was cleared out, leaving a jagged edge. Microscopic examination showed portions of a placental membrane; no drainage. The patient recovered.

Case 10.—M. M., the mother of seven children, the last twins, born eight years ago, admitted May, 1895. Regular till the previous November, since which time she has had irregular bleedings. A week previous to admission she had a severe attack of pelvic pain with fainting. On admission there was marked tenderness over the whole abdomen, and a tumour rising half way to the navel. The tumour occupied all the pelvic excavation. On opening the abdomen, the tumour was felt lying behind the uterus, and apparently between the layers of the broad ligament. Its upper surface was covered by densely adherent omentum and intestine. On dissecting these off with much difficulty, the swelling was found to extend completely across the pelvis from one side to the other, and raising upwards the peritoneum of Douglas's pouch. Its appearance was that of a gravid uterus, being covered with hypertrophied muscular fibres and dilated veins. The sac was opened and a living fœtus of about six months was removed. The placenta was firmly adherent to the

walls of the sac. At one part a portion of this was accidentally detached, and there was a small amount of dark venus oozing, otherwise there was no bleeding. The edges of the sac were united with silk sutures, but owing to the depth of the lower portion, not very satisfactory; the abdomen was closed without drainage. The patient died on the third day, the following being an extract from Mr. Berry's notes on the *post-mortem* examination :—"The uterus three times the normal size; behind and firmly attached to it was a transversely elongated oval sac in the broad ligament. Anteriorly it was smooth, and in contact with the round ligament. The posterior wall was formed by a layer of muscular tissue one-sixth of an inch thick. The sac was closed with silk sutures everywhere except at the lowest corner. Douglas's pouch was nearly obliterated. The placenta, as large as the fist, was attached to the anterior part of the sac, a portion of it being detached; the whole of it was soft and friable and beginning to decompose. The sac contained some blood-stained fluid, some of which had leaked into the peritoneal cavity."

Eight of the cases recorded were admitted under the care of my colleague Dr. Champneys, the remaining two under Dr. Griffith being transferred to me for operation, and it is with their kind permission that I am able to publish the cases. I would also wish to thank Mr. Bruce Clarke for his valuable assistance in all the operations.

Dr. Lewers observed in respect of the indications for operation, that while these cases could often be diagnosed on the strength of certain symptoms and signs with something approximating certainty, there were on the other hand cases in which the symptoms were obscure and acute, and the patient extremely ill, and then the question arose both as to diagnosis and as to whether an operation ought not to be done. This decision threw a great responsibility upon the surgeon, and especially upon the obstetric physician. He alluded to a case that he had seen on the previous Thursday which illustrated a point he had in his mind. The patient, 34 years of age, had not menstruated for two months, and it was four years since her last pregnancy. During the preceding fortnight she had had two or three attacks of pain in the lower abdomen with slight faintness, not amounting to actual loss of consciousness, and not bad enough to oblige her to lie up. Four days ago, on leaving her bed, she was seized with a violent pain in the abdomen and fainted. He saw her the same afternoon and found her very ill with the uterus enlarged and an indefinite swelling on the right side, the pulse being about 106. He did not at that time feel quite certain as to the propriety of operating but in the evening the pulse had risen to 120, so he had her removed to the London Hospital, where he opened the abdomen. This was full of blood clot and fluid blood due to rupture of the right tube, which was actually bleeding. The uterus had the appearance of a uterus at the third month of pregnancy. A curious point was that the tube on the other side was also dilated, and was removed with its contents, which consisted mainly of blood, but he had not as yet been enabled to carry out a search for chorionic villi. So far the patient had done well. He also referred to a case of the same kind some years ago, in which, after washing out a large quantity of blood clot, &c., he had closed the wound without

leaving in a drainage tube, and, although that patient did ultimately recover, convalescence was very protracted. He therefore used a drainage tube in the last case just mentioned, and so far there had been no disturbance. Several other cases under his observation pointed in the same direction. He remarked on the occasional absence of changes in the breasts, but he thought that in most cases at three months the appearances of the breasts yielded valuable assistance in arriving at a diagnosis.

Dr. Routh referred to a paper which he had contributed to the Obstetrical Society, in which he had collected a large number of cases specially bearing on the question of diagnosis and after-treatment. He thought that in Mr. Doran's cases there was not any possibility of a certain diagnosis, which after all was of the greatest importance. He concluded from Mr. Doran's remarks that he did not believe it to be possible for a hæmatocele to occur without its being also a case of pregnancy, but some of the symptoms reported by him as pointing to ectopic gestation, might be exactly mimicked by a case of hæmatocele, accompanied by violent pain, sudden cessation of the catamenia, &c. He had lately seen some cases at the Samaritan Hospital, in which one man had diagnosed ectopic gestation, and another had diagnosed hæmatocele from other causes. If it were really a case of the latter, the best treatment was to leave it alone, for such cases did best when not interfered with, whereas in ectopic gestation they were often bound to operate. The symptoms mentioned by Mr. Doran related mainly to the breasts, which in his opinion, presented the appearances of pregnancy. He asked what appearances Mr. Doran referred to in this respect. He (Dr. R.) maintained that unless one got the peculiar appearance of the secondary areola, it was impossible to be sure that it was a case of pregnancy. They ought always to enquire whether the discharges from the vagina were coffee-coloured or shreddy. Where they had to do with a one-sided tumour, associated with the discharge of shreds present, then, if the microscopical appearances were those of decidua, they might come to the conclusion that it was a case of ectopic pregnancy, and without those signs they could not. Then not a word had been said about auscultation, not necessarily by listening over the abdomen on either side and over the tumour, but by using the instrument which he (Dr. R.) was surprised was not more used, viz., the binaural vaginoscope. With this instrument one might hear the ordinary souffle within the vagina by direct application on the tumour, which would materially assist in arriving at a diagnosis even if all the other signs were wanting. He thought it very probable that neither of the authors had made use of the instrument, at any rate in the diagnosis of these cases. He urged that if by this means one could make sure of arriving at a correct diagnosis, it was of the greatest importance to adopt it. Mr. Cripps' plan of dividing the cases into three varieties might do very well to teach a class of students, but in one of his cases he had said that he could not detect any appearances at all pointing to ectopic gestation, but the reason was that unless the tumour was low down it was impossible to make out anything very certainly with the fingers. He thought the author would admit that in this particular case he could not possibly know what the case was, until he had opened the abdomen.

Dr. Leith Napier observed that there was one point of diagnosis which did not seem to have been mentioned, *viz.*, that in addition to the situation of the swelling on one side and slightly behind the uterus, as usually met with in early ectopic gestation, one could generally feel

marked pulsation of the uterine artery on that side. The explanation for this was not difficult; as a diagnostic sign, it had more than once led him to form a correct opinion. He recalled a case in which a woman who had never had any children became very seriously and suddenly unwell. She sent for her doctor, who called upon him to see the case. He had examined her and detected this pulsation in addition to other symptoms of ectopic gestation, whereupon he had advised operation. A little delay occurred in arranging for this, and for obtaining the husband's consent, and within three hours from the time she was first seen she was dead. The *post-mortem* proved the correctness of his diagnosis. As a contrast, he mentioned another case which he had seen: this was that of a lady from the country, also without children, though married seven years. On the day previous to his seeing her in consultation, she had jumped from her carriage and run across the platform to catch a train. She travelled up to town, did a long day's shopping, and next day a large smooth swelling was found in the abdomen, reaching half way to the umbilicus. He regarded it as a hæmatocele of doubtful origin, and waited for further signs. In this case the tumour gradually disappeared, and curious to relate, within a year the patient was delivered naturally at term. If he had wished to make up a long list of cases of ectopic gestation, he would have added this to his collection; but he preferred to class it as "not proven," a course which he thought Mr. Doran might have adopted with respect to his fourth case in the table. Dr. Routh had rightly called attention to the three cardinal symptoms, but he would direct his attention to a case brought by Dr. Griffith before the Obstetrical Society,* in which a complete decidual cast of the uterus was passed similar to that met with in ectopic gestation. In consequence of this and other indications, a diagnosis of ectopic gestation was made. Abdominal section was performed, but there was no evidence whatever of extra-uterine gestation. If this operation had been undertaken in certain circumstances it would have been looked upon as very meddlesome surgery, but fortunately the patient got well, and so no harm was done. Passing on to the treatment of the placenta, in cases of advanced ectopic pregnancy, he observed that this was really the only unsettled question in respect of the treatment of these cases. Ought one to remove a placenta attached to intestine or not? He thought they would agree that when removal could be easily effected, without running the risk of alarming and dangerous hæmorrhage, the placenta ought always to be removed; the patient could, to some extent, be protected against shock by saline injections. In other cases, when the placenta could not be removed safely, the cord should be cut off short, the cavity packed with antiseptic gauze, and the abdominal opening closed. If necessary, on account of septic symptoms, the stitches could be taken out in four or five days, or sooner, when the risk of bleeding would be much less. Several cases had been treated successfully in this way by continental operators. In some cases the placenta had been undisturbed.

Mr. Bruce Clarke said he had been present at all the operations related by Mr. Cripps, and he had had some experience of the kind of his own which he proposed to relate. He was practically in accord with the remarks that speaker had made. There was, however, one point, already touched upon by Dr. Leith Napier, viz., the question of the decidua. The case he referred to, which was shown by Dr. Griffith at the Obstetrical Society, was one that was thought both by Dr. Griffith and himself to be a case of ectopic gestation on account of the passage of the decidua, and

* 'Trans. Lond. Obstet. Soc.,' vol. xxxvi, p. 355.

he operated, but no trace of extra-uterine pregnancy was found on opening the abdomen. The patient, he was happy to say, recovered without a bad symptom. He himself had been called to a patient suffering from what seemed to be an ordinary chronic attack of peritonitis, which had come on slowly with a certain amount of pain low down in the pelvis, and had gradually culminated in obstruction, retention of urine being also present. On cutting down he found indeed that there was undoubted obstruction with a considerable amount of peritonitis, and he came upon a collection of pus down in the pelvis. All he could do was to let out the pus, and wash out the abdomen. He certainly did not realise the nature of the case at the time, nor was it suspected by others who were present. The patient gradually sank from exhaustion, and it was only discovered *post-mortem* that the condition was due to an extra uterine pregnancy which had ruptured. With a history like that, one ought always to be on one's guard, and in a similar case in the future, one would probably discover the cause of the peritoneal inflammation.

Dr. SPENCER admitted that it was by no means infrequent for the rupture to be encysted in Douglas's pouch as suggested by Mr. Cripps. He himself would, however, go even further, including in the category a considerable number of the cases that were supposed to have ruptured into the broad ligament. In operating on such cases one found that the sacs appeared to be there, the surface of the sac (which he believed to be a false membrane formed from the effused blood), closely resembling the surface of the true broad ligament. The study of these cases, of which he had seen several, had led him to think that they, like cases of ovarian tumour, said to be in the broad ligament, were not really in the broad ligament, but that the membrane was formed in the way he had suggested. The next interesting point was as to the formation of a sac-wall in these cases of hæmatocele. He thought the sac was formed by the organisation of the outer layer of blood-clot, which formed so rapidly and looked so old, that one was surprised it should have formed in such a short time. The most important points in connection with the treatment of extra-uterine gestation were :—(1) when to operate ; (2) what to do with the placenta. With an early and dead fœtus, which was a very common thing, there were many of such cases which turned out favourably if they were not operated upon. He thought that serious consideration of the frequency with which ectopic gestation was now met with during operations, and the comparative rarity with which they were seen *post-mortem* 15 or 20 years ago showed that a large proportion of them must terminate favourably without operation. Personally he had seen a very considerable number of such cases. When there was a living fœtus, say from six to eight months, what ought one to do? He had seen two of these himself, and they both terminated fatally. He used to hold the opinion that it was better to wait awhile, the mortality for the mother being much less after the death of the fœtus. He had, however, quite made up his mind for the future that when he was satisfied that the ectopic cyst contained a living fœtus, he would not waste any time in waiting, but would operate at once. The first case he had so treated was on account of the great pain caused by the fœtus. He had cut down upon the centre of the placenta, and had removed it entirely, though with terrible hæmorrhage. The patient died unexpectedly of syncope in a few hours. The other case was seen at five months with a living fœtus and it went on growing. He hoped to get a living child and a living mother. She went on to seven and a half months when the sac ruptured a second

time, and he had to operate at once. He removed the fœtus from the sac and the blood from the peritoneal cavity, cut the cord short, put in gauze and stitched up the wound, but she also died within 24 hours, death being due apparently to an acute form of sepsis due to his having left the placenta behind. He had, therefore, made up his mind never to leave the placenta behind again, for he feared hæmorrhage less than the possibility of sepsis.

Mr. Malcolm thought it ought not to be allowed to pass without challenge that the chances of recovery were great if no operation were performed on the cases that ruptured in the early stage. No surgeon who had seen the abdomen filled with blood from the rupture of the sac could deny that an extra-uterine fœtation was a very serious matter. Although many patients recovered, the speaker thought that an operation should be performed whenever the condition could be diagnosed. If there were no immediate danger there was always a liability to danger. A second or a third loss of blood might take place without causing much alarm, and then a severe hæmorrhage might suddenly induce a moribund state. Mr. Malcolm asked Mr. Cripps if he had met with cases in which the sac had ruptured into the small intestine. He had seen two such cases operated on, and the possibility of this was another reason for immediate operation, whenever a diagnosis of extra-uterine fœtation was made. With regard to diagnosis, he had that day admitted to hospital a patient, who had been married the day before last Christmas, and who was supposed to have miscarried on February 22nd. Whatever came away it was not seen by any medical man. Ten days later she was seized with severe pelvic pain, and was put to bed in a fainting condition. This was recovered from, but faintness had recurred frequently since that time. Mr. Malcolm had seen her two days before her admission, and found a large, soft, tender mass filling the pelvis and pushing the uterus forward. There was then no sign of hæmorrhage. He believed that this was a case of extra-uterine fœtation, but one of his colleagues who had seen the patient with him did not agree with this diagnosis, and thought the patient would get well without operation. He mentioned the case to show how difficult the diagnosis might be.

Dr. Spencer said Mr. Malcolm had misinterpreted his remarks. He did not say that the condition was without danger, but that a large proportion of them got well without operation. He himself had severa times operated upon early cases with success.

Mr. Marmaduke Sheild said he had seen three cases in which the fœtus had gone on to or nearly to term. In all these cases the fœtus was afterwards removed successfully. One burst into the bowel, leading to an offensive purulent discharge from the rectum with a large tumour in Douglas's pouch. By enlarging the hole in the rectum the whole was extracted. In another case of extra-uterine gestation, apparently at full term, the mass was removed by an incision through Douglas's pouch made *per vaginam*. The third case he had brought before the Obstetrical Society four or five years ago. The fœtus sloughed through the abdominal walls near the umbilicus. He removed it by abdominal section, and that patient did quite well.

Mr. Alban Doran in reply referred to the question of the appearances of the breast. He recalled his remarks that in the first class alone did the changes in the breast point to pregnancy. The remainder he had noted were all more or less sickly; he meant to say that the breasts, even in early normal pregnancy in sickly subjects often developed slowly. The

evidence was, in fact, so often negative, that when the breasts did not show any changes, that circumstance by no means proved that normal or ectopic pregnancy did not exist. He said that there were possibly other causes of hæmatocele than ectopic fœtation, but the microscope had in so many doubtful cases revealed the presence of decidua. Chorionic villi were scarcely known to operating surgeons ten years ago, whereas now they were quite familiar with the appearance of these important structures. A special examination of the shreds passed from the vagina ought always to be made when an opportunity occurred. In Case 2 the shreds were an important clinical feature, which dispelled a suspicion that there was perityphlitis and not ectopic pregnancy. All Mr. Doran's cases were much too early for auscultation; besides, rupture had evidently occurred before they came under his care. He pointed out that the pulsation of the uterine arteries was often met with in suppurating tubes, as well as in fœtal cysts, and he referred to one case, which he said Mr. Malcolm would probably remember, in which this pulsation was very marked, and in which Mr. Doran subsequently removed two large tubes full of pus. He admitted that Case 4 was not proved, but the evidence in favour of its having been a case of ectopic gestation was very strong. He mentioned in relation to Dr. Herbert Spencer's case, that the best of the continental authorities were much divided in opinion as to the nature of certain casts from the uterus. The distinction between a dysmenorrhœal and a uterine decidual cast was not always easy to recognise. Dr. Spencer had raised the important question of false capsules. These were very dangerous things in pelvic cysts and still more so in extra-uterine cases. When the surgeon was enucleating a tumour from a true capsule, he could work freely, but if it were not a true capsule, but a layer of lymph on adjacent structures, he might poke his fingers into small intestine or make holes in diseased omentum or tear through a ureter. In all doubtful cases the surgeon must be very careful about what he took to be a capsule. He agreed with what Mr. Malcolm said about the danger of early rupture and recurrent hæmorrhages. Authorities were not certain as to the precise pathological meaning of these recurrent hæmorrhages which did not necessarily result from the breaking down of adhesions. He referred to a case which occurred 18 years ago in which the operation had been postponed, and the patient had a second attack, and a third attack which proved fatal. The specimen from that case was in the Museum of the College of Surgeons (No. 4626). It was very difficult to distinguish between tubal abortion and rupture of the tube. At the operation the surgeon should make it a rule to look for the fundus uteri, and when it could not be made out he must search for the round ligaments running to the inguinal canal, and then trace them on to the uterus, pushing the parts backwards. As to opposite appendages he said they were often diseased, but their removal would take some time and would complicate an operation which was never without considerable risk; moreover, it was best not to suppress menstruation, if possible. When the appendages were bound down it might be right to liberate them from adhesions. The best sign of early extra-uterine gestation was the sudden development of a mass on one side of the uterus associated with severe pain. If the tumour formed gradually it might mean half a dozen different morbid conditions, but if within a few weeks, then the chances were ten to one that it was a case of extra-uterine gestation.

Mr. Cripps in reply thought Dr. Routh was too positive in saying that

the passage of decidua was absolutely diagnostic. It was really on account of that dogmatic statement that the surgeon had been called upon to act in the case referred to. He admitted that it was not his practice to make use of the stethoscope in the diagnosis of these cases. In one of his cases there was a hole at the bottom of the sac leading into the rectum which he could only partially close, but the patient ultimately did well. The argument in favour of operating directly a fœtus was discovered, without regard to its being living or not, was hardly logical, seeing that both Dr. Spencer's cases proved fatal. He admitted, however, that his only fatal case was of this kind. He said he had been very much impressed by the statistics brought together by Mr. Bland Sutton, showing that in 16 cases in which the patient was carefully watched and operated within a short time of the death of the fœtus all the mothers recovered, whereas of 14 cases operated upon whilst the fœtus was living, eight mothers died.

April 27th, 1896.

THE CAUSATION AND TREATMENT OF MAMMARY ABSCESS.

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In these days of striking novelties in surgical matters there is always an inclination to commence with an apology when one writes a paper upon a medical or surgical malady of common occurrence, which is ordinarily met with in practice, and the diagnosis and treatment of which are supposed to be generally well known. Such a subject is suppuration within the mammary gland, and I have been induced to bring it forward because of its importance in all classes of practice, and because I feel sure that the operative treatment of mammary abscess as ordinarily conducted is by no means satisfactory in its results. The very commonness of the affection would serve as a sufficient plea for my bringing it before a society where men of all varieties of practice meet on common ground. There are many points regarding mammary suppuration of great interest. Not the least are some of the modern methods of treatment, and the frequent diagnostic difficulties that from time to time arise. As regards the causation of these affections, though everyone connects them with suckling and lactation, yet instances occur in practice which are quite inexplicable on these grounds, and it is here that the special diagnostic difficulties arise which renders

the subject of mammary abscess so immensely important to surgeons. Taking first the common form of acute mammary abscess, I need only state a few figures to show its close relation to lactation. The total number of cases of abscess of the breast admitted into St. George's Hospital between 1870 and 1895 was 200. The right breast was more commonly affected. Both breasts were affected in 13 instances. There were two cases affecting males: one due to pyæmia and the other to a blow. Out of the 200 cases, 169 were directly due to lactation, and referred to sore nipples in women of the child-bearing age; 31 were due to other causes; of these, eight seemed directly attributable to a blow, one was due to necrosis of a rib, and 22 were due to no certain cause; but of these in five instances the abscesses originated on the site of former abscesses, and there was in three a suspicion of the affection being tuberculous. In the 22 cases, the patients were either young girls or women between 40 and 60 years of age. The youngest were 11 and 15, and the oldest 58 and 67 years of age. In only two cases was the abscess submammary. In the majority of instances the pus was within the gland substance itself. In several of the older patients the abscess was thought to be a solid tumour, and the true nature was only discovered after exploration.

In like manner I have studied 60 cases of abscess of the mamma admitted into University College Hospital for six years, from 1884 to 1890, selecting that period because then alone were full particulars given of the nature of the abscesses and the time they occurred after lactation. Of the 60 cases, 51 were associated with pregnancy or lactation in women of varying ages. The left breast slightly preponderates in order of frequency of attack. Of cases of chronic abscess there were eight occurring between the ages of 35 and 51 years. In one of these, blows were mentioned as a likely cause. Several of the chronic abscesses were only differentiated from scirrhus by exploratory incision, being associated with ulceration of the nipple, and in one the nature of the contents seemed likely to show that the supposed abscess was really an ancient galactocele with inspissated contents. One case of acute superficial abscess occurred in the male breast just beneath the areola, and no cause could be assigned for it. Of 102 cases of abscess related by Bryant,* 79 occurred during

* 'Diseases of the Breast.'

lactation, two during pregnancy, and 21 in non-lactating, non-pregnant women. Birkett,* in examining 149 cases of mammary suppuration, noted that 132 of them occurred in suckling women. Among 72 cases published by Nunn, 58 occurred in lactating women, seven in pregnant women, and seven in non-puerperal women. Of 230 cases collected by Jamain and Terrier,† 183 were connected with the puerperal state, 47 occurred during pregnancy, and 34 were not connected with either condition. McClintock‡ preserved notes of 82 cases of mammary abscess, and found the preponderance on the left side. Of all the abscesses he had seen, the vast majority made their appearance during the first six weeks of lactation. As regards the time after parturition that mammary abscess occurs, I find the greatest variability. Some of the cases occur as early as the first, others not until the fourteenth month. Birkett § found that in 116 cases half of them occurred as early as the first month after parturition, and a large proportion of these as early as the first week. In 50 of the St. George's Hospital cases collected by myself, where the time after parturition is noted, the majority occurred later than this, 38 cases occurring in the period between the second and the fourth month. Bryant || found that out of 102 cases, 68 occurred in the first two months after pregnancy. It would seem very difficult, if not impossible, to strike an average regarding the exact month at which lactation abscess is the more common; but Nunn, Birkett, and Bryant are all agreed that this affection is most frequent in the early and late months of pregnancy. Birkett ¶ estimates that half of the cases are associated with defective or sore nipples. Personally, I believe the average is far higher than this, and I have never seen a case of acute mammary abscess in a young woman without being able to observe, by the aid of a lens, breaches of surface in the vicinity of the nipple by which organisms might readily enter the lymphatic channels. Through the courtesy of Dr. Griffiths and Dr. Grigg I have been able to inspect the records of Queen Charlotte's

* 'Holmes's System of Surgery,' vol. iii, p. 434.

† 'Manuel de Pathologie et de Clinique Chirurgicales,' tome iv, Maladies du Sein, p. 686.

‡ 'Clinical Memoirs,' pp. 309–310.

§ 'Holmes's System of Surgery,' vol. iii, p. 435.

|| 'Diseases of the Breast,' p. 25.

¶ *Op. cit.*

Lying-in Hospital, and I was greatly struck at the remarkable infrequency of mammary abscess at that institution. Out of 1,000 cases examined by myself, taken by selecting 200 at a time, out of different years in the practice of various physicians, to my surprise not a single case of mammary abscess was found. The medical officer was obviously on the alert to note such conditions, for cases of "milk-engorgement" with threatening inflammation were here and there noted. It is true that the majority of parturient women were early discharged from the hospital, say, in a fortnight or three weeks; but, on the other hand, it must be pointed out that most of the patients were primiparæ in whom the nipples are often badly developed, badly cared for, and frequently sore. The cause was not far to seek in the precautions taken by the physicians to ensure the cleanliness of the nipples and of the infant's mouth, and this brings me to enunciate the first important proposition of this paper, that in the vast majority of cases acute mammary abscess, whether during lactation or not, and in either sex, is due to absorption by the lymphatics of organisms, which enter abrasions on the nipple or areola. The common organisms found on the skin can nowhere be more abundant than in the axilla or about the areola of the mamma—parts moist and protected, and affording every opportunity for active increase and growth. Moreover, round the nipple is a fossa kept moist by the secretion of especial sebaceous glands, and in such a locality organisms most abound. The least breach of surface is inoculated as surely as though the surgeon had rubbed in the virus intentionally.

During lactation the vascularity of the breast and the rapidity and vigour of its lymphatic circulation render absorption very marked. The organ is engorged with blood and full of an animal fluid, affording an excellent medium for the prolification of organisms. All these considerations are sufficient to explain why the least breach of surface about the nipple of a lactating breast so readily leads to abscess. Modern investigations into the true causes of suppuration exclude engorgements of the mamma as having anything to do with mammary abscess except as a predisposing cause. In former days the milk was thought to be the cause of mammary and puerperal affections. Thus puerperal insanity was termed "mania lactea," and iliac phlebitis was commonly termed "milk-leg." These erroneous terms were first publicly denounced

by Meigs, who applied the contemptuous epithet of "milkmen" to his professional opponents. The organisms found on the skin capable of originating suppuration are probably numerous and need not here be enumerated. Modern writers on dermatology, especially in Germany, have recognised the fact that many of the suppurative affections of the skin associated with local infective qualities, as boils, pustules, and impetiginous eczema, are due to the entrance of organisms, especially staphylococci, by minute abrasions or by the mouths of the ducts of the sebaceous glands.* Dr. Slater, bacteriologist to St. George's Hospital, has kindly examined for me the pus taken from acute mammary abscess. In all of the cases abundant staphylococci were found, principally the staphylococcus aureus. Jamain and Terrier are of the same opinion.† "Abscess of the breast," write these authors, "is the result of infection." The most common agent is the staphylococcus, sometimes the streptococcus, and, according to Bumm, in exceptional instances the gonococcus. In accordance with the view that all cases of acute mammary abscess are due to the entrance of organisms from the neighbourhood of the nipple, I must view with doubt those cases of so-called acute idiopathic abscess that occur in the unimpregnated condition. Among the St. George's Hospital cases are found instances of acute abscess occurring in girls as early as the age of 15 and 11 years, and no apparent cause was to be found. In neither of those cases was an examination made of the nipple and areola with a lens, and without such precaution an abrasion may be readily overlooked. I had an opportunity of observing an important case which bears out this view under the care of Mr. Pick in the wards of St. George's Hospital during the past year. A middle-aged, healthy-looking single woman had noticed for about a year that the left nipple was occasionally "a little sore." A week before admission she had complained of acute pain in the left breast with some swelling. There was an apparent tumour the size of an orange in the left breast, hard but markedly tender, with a sense of elasticity towards its centre and a faint red blush on the skin. At the base of the nipple was a small abrasion covered by a scab. The appearances were very similar

* Malcolm Morris, 'Diseases of the Skin,' p. 327.

† 'Manuel de Pathologie et de Clinique Chirurgicales,' tome iv, deuxième fascicule, p. 687.

to scirrhous cancer. An exploratory incision evacuated creamy pus, which was examined by Dr. Slater and found to contain the staphylococcus aureus in abundance. The abrasion on the nipple might readily have been overlooked without close examination.

Although in the numerous instances where chaps and excoriation about the nipple become infected with organisms, the staphylococcus—especially the staphylococcus aureous—appears to be common, yet there is nothing to prevent organisms of a more virulent nature from entering the tissues. This will, perhaps, explain cases which the older writers used to term diffuse phlegmon of the breast, where the tissues became gangrenous and the patient rapidly sank. Such cases are certainly rare. I have never seen one, and they are scarcely mentioned by modern surgeons. Velpeau * notices the case of a healthy and powerful young woman, who was neither pregnant nor recently confined, who was attacked with what was considered to be "erysipelas" near the left nipple. The swelling increased with a rapidity similar to that observed in the scrotum, eyelids, or cellular tissue elsewhere. A large gangrenous patch formed over the external half of the gland and the patient rapidly sank. In such a case modern investigation would probably have discovered such organisms as streptococci and the bacillus septicus.

The cases, says Spiegelberg, in which abscess of the mamma is part of general septic infection must be very few. Rokitansky mentions the occurrence, and other cases are related by McClintock and one by Spiegelberg † himself McClintock's case of abscess due to general septic infection is referred to in his clinical memoir on diseases of women (page 325). "Only one example has fallen under my notice in which I felt satisfied the abscess of the breast was purely symptomatic. In this instance it succeeded to uterine phlebitis. An enormous swelling, attended with great pain and some discolouration of the skin, formed in the superior part of the right mamma, extending upwards to near the clavicle. On dissection, an immense quantity of unhealthy purulent fluid was infiltrated throughout all the structures of the part." The records of the Middlesex and University College Hospitals show us no examples of pyæmic abscess of the breast, and it is not mentioned by writers of repute. I have only been able to find

* 'Diseases of the Breast,' p. 31.

† 'Text-book of Midwifery,' vol. ii, p. 408.

one case of abscess of this nature in the records of St. George's Hospital in twenty-five years, though it is right to point out that in fatal cases of pyæmia a small abscess in the breast may readily have been overlooked. A feeble man was admitted into St. George's Hospital on July 30th, 1884. He was too ill to give an account of himself, but it was gathered from his wife that he had been ailing for about ten weeks with "aches and pains all over him." Five weeks before admission a painful swelling began to form in the left breast and right nipple. On admission a large abscess was opened in the left breast, and an incision over the right inner malleolus was made through brawny indurated tissue. This patient remained in the hospital for nearly seven months with all the symptoms of chronic pyæmia, abscesses being opened in the buttock, the calf of the leg, and the sterno-clavicular articulation. He finally recovered after a severe and protracted illness. The primary focus of infection was doubtful, but abscess undoubtedly first formed in the left mamma.

I have asserted that the vast majorityof cases of acute mammary abscess are caused by the direct action of organisms which enter the lymphatic channels. There yet remains another possible method of infection which is of the highest interest and which possibly has not received the attention it deserves—*i.e.*, the entrance of organisms along the milk ducts themselves. I have already referred to the fact, now well known among dermatologists, that organisms may enter the sebaceous glands of the skin and thus produce the phenomena of boils and pustules. Seeing that the breast is only a highly differentiated sebaceous gland one suspects that the same might here occur. Nocard of Lyons produced tuberculous mammary abscess by injecting tuberculous virus into the milk ducts of a lactating goat. Boissard, in a clinical lecture delivered in Paris in 1893,* speaks very positively of the invasion of the milk ducts by streptococci and staphylococci. He terms the resulting suppurative affection galactophoritis. Chassaignac called the disease canalicular intra-mammary abscess. Nyeth † relates the case of a woman aged 42 years who was non-lactating and affected with bilateral mammary abscess which burrowed through and destroyed both breasts. He terms the case infection of the mammary gland through the nipple and galacto-

* 'Semaine Médicale,' 1893, p. 499.

† 'New York Medical Journal' for 1890.

phorous ducts. The destruction was so extensive that both breasts were ultimately amputated, which seems a very severe remedy. The branching nature of the abscesses along the milk ducts seems especially to impress the writers upon galactophoritis. It is always open to doubt in these cases that some breach of surface does not really exist, and although the experiments of Nocard place it beyond doubt that infection by the ducts is possible it is certainly not common. For three years I have closely examined a number of cases of mammary inflammation and abscess without finding a single case where I could certainly attribute the abscess to infection through the milk ducts themselves. Moreover, in 1894 Professor Sherrington and myself performed two experiments at the Brown Institute which had a negative result. In a lactating cat and a lactating rabbit milk was squeezed from the mammary gland, and where the ducts were empty and ready for absorption pus was well rubbed into their orifices and allowed to dry there. In one case fresh pyæmic pus was used, in the other secretion from a tuberculous abscess. In neither of the cases did any reaction or alteration occur. I think these two experiments, which were carefully done, go some way to show that suppurative processes do not readily pass along the milk ducts of animals. What the effect of gonorrhœal pus upon the milk ducts of the human subject may be it is, of course, impossible to prove by experiment; but, judging by the way it affects the urethra, one would imagine that purulent inflammation would readily result. The principal importance of purulent inflammation of the milk ducts are the serious results which may possibly occur to the infant. We hardly yet quite understand the extraordinary influences which the mother's milk may exercise on the infant for good or bad. We, indeed, are aware that certain drugs are excreted with the milk and that emotional disturbances and febrile attacks on the part of the mother have deranged the digestive system of the infant. The presence of pus in the milk would be likely to cause very serious consequences, and I recommend this investigation especially to those who are interested in the dietary and management of young infants. Dr. R. A. Gibbons* relates a most interesting example of fatal and acute purpura hæmorrhagica in a child. The case is a very striking one, and one can hardly doubt on considering it that the condition

* 'Medical Times,' January 3rd, 1885.

was due to the pernicious effect of pus in the milk. The child had suffered from severe diarrhœa, and was progressing well upon asses' milk until suddenly he became extremely ill with severe epistaxis and all the familiar symptoms of hæmorrhagic purpura. He died after an attack of severe hæmatemesis. About six days previously to his death his mother noticed a thick sediment in the milk, and on inquiry being made the donkey which supplied the milk was found to be suffering from abscess of the udder. Dr. Gibbons states further to me: "I know of two cases in which mammary abscess was developed, and before the suppuration was pronounced the infants were ill. One of these cases, a wet-nurse, I admitted under my own care at the hospital, and she had several abscesses of the mamma."

The influence of blows in causing abscess of the breast is well known. When suppuration occurs in the male breast it is usually due to this cause. Bryant* found that of 12 cases eight were attributed to local pressure or injury, causing extravasation of blood. I have notes of three cases where abscess of the male breast followed a kick, a blow from the horn of a cow, and the pressure of a shoemaker's last. In these instances it seems quite plain that a communication is established between an area of tissue containing extravasated blood, the resistance of which is impaired, and the external parts through the torn or injured ducts, and hence organisms may enter and produce injurious effects. Abscess in the breast of infants has been frequently recorded, and appears to be largely a preventable malady. The milky exudation which flows from the nipples of some infants is almost entirely due to disintegration of the central cells of the columnar epithelial masses of which the primary gland is formed. When ignorant nurses in these cases pull or rub the nipples, a breach of surface is effected by the rupture of a milk duct or abrasion of the integument of the nipple, and, organisms entering, an abscess is the result. In the well-conducted large "lying-in" hospitals of this city, abscess of the breast in infants is practically unknown, yet the swelling and hyperæmia associated with secretion of spurious milk are not uncommon, and often lead to feelings of alarm in the mind of the medical attendant. A case of mammary abscess in an infant three weeks old is related by Dr. Stephen of Lettercairn.† It is said to have been caused by

* 'Diseases of the Breast,' p. 53.

† 'Brit. Med. Jour.,' July 25th, 1874.

"retention of milk." The child, a female, was sixteen days old when the right breast inflamed, pointed, and was opened, when about an ounce of thick greenish pus escaped. On examination a milky secretion was found issuing from the left breast, which was examined with the microscope and found to resemble the maternal milk, except that the latter contained more corpuscles. A case of double mammary abscess in a male infant is related by Dr. Wilks of Ryde.*

Attention being drawn to the subject, a number of cases of abscess in infants are recorded by various practitioners.† Most observers refer the occurrence of the abscess to the practice prevalent among ignorant nurses of pulling and rubbing the nipples. Dr. Robert Barnes‡ backs up this assertion, and states that, when he was house surgeon to a lying-in hospital, he encountered several cases of abscess in the breasts of infants due to the manipulations of nurses. Numerous other instances may be found in surgical literature where experienced practitioners attribute cases of abscess in infants to this practice.

In cases of swelling and engorgements in the breasts of infants, were the attendant content to keep the parts about the nipple scrupulously clean with a very dilute mercurial wash, and to apply graduated pressure with cotton wool and bandage, the phenomena of abscess would probably never occur. Suppuration in connexion with new growths in any part of the body is extremely rare, and the same is true of new growths of the breast. Abscesses may, however, be found in the neighbourhood of ulcerating cancer, and the same phenomenon is sometimes observed in other parts; thus we find abscess of the neck with ulcerating epithelioma and abdominal abscess with ulcerating carcinoma of the intestine. In very exceptional cases the cysts of sarcoma or adenoma may contain pus. Should they be artificially inflamed or inoculated with septic material, as by the introduction of a dirty trocar, suppuration is, of course, not uncommon. In the days when caustics were employed to remove cancers of the mamma, surrounding abscess and cellular inflammation were often enough exemplified. In the year 1867 a patient was treated in St. George's Hospital for scirrus of the left breast

* 'Brit. Med. Jour.,' August 1st, 1874.

† *Ibid.*, August 8th, 1874.

‡ *Ibid.*, August 15th, 1874.

with the chloride of zinc paste inserted in the form of arrows into the diseased mass. The whole breast sloughed out, but severe rigors and fever ensued, and a large abscess formed in the other breast. The patient died apparently from pyæmia. A good instance of abscess of the breast in association with scirrhus is the following. A woman, aged 76 years, was in St. George's Hospital in 1883, with a hard scirrhous cancer growing in the left breast, and which had existed for two years. Lately the tumour had ulcerated, the nipple was retracted, and the skin adherent. There was a large abscess stretching from the nipple to the axilla. The abscess was opened, and much foul pus evacuated. The tumour and pectoral muscle to which it was adherent were removed. The patient recovered favourably. A single woman, aged 33 years, was in St. George's Hospital in 1889, suffering from a tumour of the left breast. She stated that this had existed for six weeks, but the history was very doubtful. Her mother had died from uterine cancer. The patient had always suffered from a painful and retracted nipple. On examination there was a large, round, tender, movable swelling in the upper part of the left breast, and the skin was non-adherent. There were some enlarged axillary glands. At consultation exploratory incision was decided on. This being performed, pus was discovered, and the sac of the supposed abscess with the surrounding breast tissue dissected out. It was later discovered that papillary growths were present on the walls of the sac. Thus the case was really one of suppurating cyst. Such instances are exceedingly rare. In the past year I saw my colleague, Mr. Bennett, operate upon a large cystic sarcoma. One of the cysts discharged pus abundantly, and there was practically a sinus communicating with a large abscess cavity. This had resulted from a puncture with a lancet made outside the hospital into one of the main cysts in connexion with the growth, allowing the cystic cavities to become septic.

Having thus discussed the probable true pathology of the acute forms of mammary abscess, a word may be said as to the position and effects of purulent collections within the gland. In nearly all our text-books the division is made into the supra-mammary, the intra-mammary, and the sub-mammary abscess. As regards the first variety, the pus forms immediately beneath the skin of the areola, and in a considerable number of cases is doubtless

due to suppuration in some of the sebaceous structures (glands of Montgomery) which exist in that position. As regards the sub-mammary abscess I may at once state my belief that abscess really beneath the gland is far more rare than is generally believed. I may here state that I have never seen a case of true sub-mammary abscess except as a consequence of caries of the ribs or empyema. I have, indeed, been shown examples where the breast has been pushed forwards as though by pus behind it, but in all of them I have found in operation that the purulent collection has been in the deeper part of the mammary gland itself, and not entirely beneath it. In short, it may be said that the majority of mammary abscesses of gravity or significance are found in the substance of the breast itself. Great havoc is wrought by untreated suppuration in the breast. The abscess burrows extensively, and in a branching and irregular manner, so that numerous pockets or recesses are formed, and multiple "pointings" and sinuses may only too readily ensue. A fatal result from septicæmia very rarely occurs, but in severe cases the patient may be invalided for many months, and suffer very severely. Sinuses may be so persistent, discharges so profuse, and destruction of the mammary gland so great that amputation has even been thought needful, as in the following case.

A married woman, aged 44 years, was in University College Hospital in 1881. She had had five healthy children, and then six miscarriages. Beyond this there was no suspicion of syphilis and no symptoms or history of tuberculosis. She had never suckled with the left breast, which had been inflamed and tender for about eight weeks. The upper and inner part of the left mamma, from the third cartilage to the xiphoid was firm, tender, and lobulated, the skin being red and adherent over low rounded prominences. Three sinuses near the nipple were discharging thin yellow pus from a superficial abscess. The liver and spleen were enlarged, smooth, and not tender. Menstruation was normal. The evening temperature was raised. The gland was described as riddled with sinuses and was amputated under antiseptic conditions, and the wound speedily healed. The gland was indurated, traversed by sinuses with granulating walls, leading to a cavity beneath the breast. The ducts were full of soft caseating material.*

In the breast it especially happens that abscesses are prone to

* 'University College Hospital Reports,' 1881.

become constricted in one part, where the pus has burrowed through a fascia or intra-mammary septum. The abscess then assumes a shape which may well be likened to an hour-glass. This most important variety of mammary abscess is too little noticed in modern times, but was long ago well described by Velpeau under the term "abscès en bouton de chemise."* I have seen several examples of this condition. The abscess shows itself as a subcutaneous swelling, and if the usual practice is adopted of making an incision radiating from the nipple the discharge will continue indefinitely; the true explanation being due to the fact that the main bulk of the pus is found deep in the substance of the gland communicating with the collection found under the skin of the areola by a narrow and sometimes sinuous channel of considerable length. I shall refer to this variety of abscess again when speaking of the subject of treatment, and meanwhile I may only point out that the likeness of the shape of the abscess to a shirt button as stated by the French writer is peculiarly appropriate.

I propose next, as briefly as possible, to pass in review the pathological causation of the more chronic varieties of mammary abscess which, though comparatively infrequent, are not less important than the acute on account of the numerous diagnostic difficulties and errors to which they give rise. And first it will be convenient to consider the influence of tubercle in producing abscess of the breast. Sir Astley Cooper noticed long ago the existence of "scrofulous tumours" in the breasts of single women; the skin becomes softened over them and finally gives way with a discharge of thin watery or curdy pus. The axillary glands are prone to share in the mischief, becoming enlarged and slowly suppurating. Dr. Charles A. Power † reports a case operated upon by Bull in 1886. This writer finds authentic records of 35 cases. Of these, 34 were in females and one in a male. Of the 34 women, 22 were married and five were single. In eight, these conditions were not mentioned; 21 of the 22 women had borne children, and six had suppurative inflammation of the breast, while three had had inflammation not going on to suppuration. In 18, the right breast was affected; in 14, the left breast, and in one both glands. The youngest patient was 17 years and the oldest 52 years. Excellent examples of this affection are related by Hebb and Shattock in

* Velpeau, 'Treatise on Diseases of the Breast,' p. 75.

† 'Annals of Surgery,' vol. xx, 1894.

the 'Transactions of the Pathological Society' for 1888, and an extensive bibliographical list is given by Shattock in the 'Lancet' of June 8th, 1889, which comprises most, if not all, of what has been written regarding the subject up to that date. Payne* has related a remarkable example of tuberculous abscess near the nipple of a child who subsequently died from general tuberculosis. The important question of the transmission of tubercle by a mother to her child from the milk was discussed in this case. Most opinions were in favour of the possibility of this, though one observer pointed out that he believed Colles' law held good in tuberculosis as well as in syphilis. Personally, I have met with six cases of tuberculous abscess of the mamma, but I will only quote one of them, which will serve as an example of the others. In June, 1893, I saw at the Hospital for Women and Children in the Waterloo Bridge Road, a pale, emaciated, worn woman, aged 43 years, who had the scars of old gland disease in her neck, and who had lost two children from phthisis. She herself had twice experienced attacks of hæmoptysis and had suffered with the left breast for about twelve months, "a lump" having broken and discharged. On the axillary aspect of the left mamma was a ragged cavity with livid undermined edges. The axillary glands were enlarged and one of them distinctly fluctuated. Close to the abscess cavity the breast was much indurated and thickened. The discharge was thin and watery, but no tubercle bacilli were found therein. The axillary abscesses were opened and the ulcer scraped and dressed with iodoform. It never soundly healed and the woman would not consent to any more radical measures being adopted. As an instance of this affection occurring in a man I may quote the following. The patient, aged 31 years, was in the Westminster Hospital under Mr. Macnamara, on September 20th, 1893. Six months before admission he had noticed a lump in the left breast, which was painless. No history of syphilis was obtainable, but the man stated he was struck with a bar on the part a year previously. The tumour is described as forming an indolent lump, movable, and not affecting the skin; the nipple was normal. There was slight glandular enlargement in the axilla. A considerable portion of the breast was removed with the caseous mass, but the affected glands were apparently left.

It would serve little useful purpose to quote numbers of those

* 'Meeting of the Pathological Society,' May 25th, 1889.

cases, for their pathology and clinical significance are very similar to tuberculous maladies occurring elsewhere. The abscess may be singular or multiple, and the surrounding breast substance healthy or more commonly riddled with small cavities containing caseating material. Thus the French writers will divide these cases into disseminated isolated tubercle, confluent tubercle, and "cold" abscess.* Practically speaking, tubercle of the breast will seldom or never come before the surgeon until its grosser symptoms are manifest. It is especially important to note that the bacillus is not always found in the discharge and the presence of caseating material on the walls of the abscess and around it is the principal distinguishing sign to the naked eye.

The symptoms of these important abscesses may thus be summarised. They are indolent in progress, forming chronic—and often—hard lumps in the breast of those who commonly exhibit signs of the tuberculous diathesis, or have marked hereditary proclivities towards tuberculous disease; the skin is commonly slightly reddened over the centre of the swelling; and finally, when fluctuation occurs, and thin watery pus is evacuated, an unhealthy ulcer with livid, overhanging edges and feeble granulations is generally left. The axillary glands are very often affected, and this, together with the hardness of the swelling in its earlier stages, has probably led to the diagnosis and treatment for cancer being adopted more frequently than surgeons are apt to allow. While exceptionally occurring in very young or in old individuals, it may with truth be said that the majority of chronic abscesses of the mammary gland are not tuberculous, and their pathology and causation are matters of the highest interest and clinical importance. Typical cases of this nature are found in women 40 years of age and upwards, in whom lactation has long been in abeyance and in whose cases apparently no known cause can be adduced. I have already stated my belief and quoted a case in point, that the true explanation of many of these obscure cases is the entrance of organisms through some slight breach of surface on the nipple or at its base. Another pathological point of great interest and importance as regards the pathology of these abscesses is the frequency with which one finds a history of antecedent abscess or inflammation in the breast, it may be many years

* Jamain et Terrier, 'Pathologie Chirurgicale,' tome iv, deuxième fascicule, p. 702.

before. So frequently do I find this, that one cannot doubt but that many chronic abscesses of the mammary gland are what were well termed by Paget "residual abscesses."* We have at present no certain means of knowing how long a time organisms may lie latent within the tissues, to be started into activity by some form of stimulation, and the whole question of the latency of organisms of disease is an untrodden ground, rich with interest and importance. Some of the many instances I have seen of chronic abscess arising in a mammary gland, the seat of old-standing suppurative mischief, may now be quoted.

A married woman, aged 42 years, was admitted into St. George's Hospital on August 20th, 1888. She had been married twenty-three years, and had borne ten children. Her last pregnancy was four years ago. Sixteen years before admission she had an abscess of the right breast, which had burst. Since then she had never been able to suckle with that breast. Six weeks ago, with no apparent cause, the right breast became painful and gradually swelled, and finally another abscess burst in the exact site of the former one. There was a sinus in the breast leading into indurated tissue. These conditions were cured by ordinary treatment. A married woman, aged 40 years, saw me at the Waterloo Bridge Road Hospital for Women, on November 25th, 1874. Her right breast had become painful and swollen without any known cause for eight weeks. She had had twelve children, and four years ago had two abscesses in the right breast. The scars of the sinuses resulting were still to be seen. Her last child was born four years ago. On examination the right breast was irregularly swollen, and just internal to a deeply retracted nipple were two rounded, red, fluctuating swellings, obviously abscesses. These were opened, scraped, and the tube brought out below, as will be hereafter explained. The pus contained the staphylococcus aureus in abundance. It is only right to point out that, although in a number of instances of chronic abscesses of the breast there is a history of past suppurative affections, yet cases are met with where no such explanation, or, indeed, any rational explanation is possible. These abscesses may occur in any part of the mammary gland, but are commonly deeply seated. They are surrounded by much dense indurated tissue, and the contents are thick and inspissated. From time to time surgeons

* 'Clinical Lectures and Essays,' p. 309.

have drawn attention to the extreme similarity between these affections and scirrhous cancer, and even with our modern knowledge diagnostic mistakes between chronic abscess and cancer more frequently occur than surgeons are willing to allow.

The symptoms of acute mammary abscesses are so well known that it would be idle for me to attempt to enlarge upon them. Yet cases are related where acute inflamed cancer exactly simulates them. Mr. Howard Marsh, in vol. xxiii of the St. Bartholomew's Hospital Reports, has recorded an admirable example of this condition. A most remarkable case of inflamed carcinoma simulated abscess was under the care of my colleague (Mr. Dent) at St. George's Hospital in March of this year. The patient was a pale, emaciated, wan-looking, single woman, aged 37 years, and her right mamma had been getting swollen and painful for three months. The symptoms of abscess were all exemplified in redness, swelling, heat, and pain, with elasticity and fluctuation, but the pain was "shooting," not "throbbing," in nature, and the skin over the swelling showed the appearance of *peau d'orange*. An incision revealed a breaking-down growth with a cavity in its centre full of blood and serum. Microscopically the growth after removal, proved to be scirrhus. The diagnostic importance of the symptom of *peau d'orange* was thus shown to be very great. It is otherwise with the chronic variety of mammary abscess. The depth at which these abscesses are situated, the induration of the tissues round them, the frequent co-existence of a retracted nipple, and chronically enlarged axillary glands make the diagnosis from scirrhus impossible without exploratory incision. Nay, even this may mislead. On August 28th, 1894, I saw a spare, healthy-looking woman, aged 27 years, a patient of Mr. Hugh Webb, of Parson's Green, who was suffering from a tumour of the left breast. She had never been pregnant. She had noticed the occurrence and gradual enlargement of the tumour for about four months. The nipple was deeply retracted, and beneath it, incorporated with the breast tissue, was a hard mass, feeling, in all respects, like a mass of cancer. The axillary glands were not affected. The family history was good. There had never been discharge from the nipple. An exploratory incision was made into the mass, and some pus welled up, but the tissue was so dense, and bore so exact a resemblance to cancer that it was thought wise to

remove the whole breast. The abscess was the size of a small walnut, situated deeply beneath the nipple, and surrounded by hard indurated tissue to the extent of half an inch. Dr. Rolleston kindly examined this tissue with the microscope, and I append his report: "Groups of atrophied and compressed mammary tubes enclosed in well-formed old fibrous tissue . . . . sections of the wall of the abscess showed well-formed fibrous tissue, with an irregular lining of small cells, among which there are some traces of hæmorrhage." It is questionable, in cases like this, whether removal of the breast is or is not the right course to pursue, and upon this most important point opinions may well be divided. The records of every hospital, if carefully perused, will afford instances of confusion between chronic abscess and carcinoma of the mamma, and will exemplify the truth that the precaution of adopting an exploratory incision will alone discriminate between these affections. A series of chronic mammary abscesses simulating cancer are quoted by Reclus,* and the same subject is dealt with at length by Castex.†

I have intentionally somewhat hurried over the subject of the symptoms of mammary abscess, for they are tolerably well known, and I am anxious to dwell upon some points in connexion with the treatment of the disease which I believe to be of the highest importance. In the first place, acute mammary abscess should be a preventible disorder if the medical attendant is careful as to the cleansing of the nipple and of the mouth of the child, and is aware of the importance of attention to the proper care of the nipples previously to marriage. In certain cases of mal-development of the nipples fissures or ulcer will arise, and in such abscess may occur even with the best care. I propose to speak of the purely operative treatment of acute abscess of the breast, without ignoring the important accessories of weaning the child, supporting the breast, the administration of various drugs, or expression of the milk by massage and the exhausting pump. The prevention of mammary abscess by expression of milk, and the use of an exhausting bottle to the nipple, is favourably spoken of by Spencer and Beale.‡ The latter also advocates the treatment of mammary abscess by opening with a trocar and

* 'Cliniques Chirurgicales,' 1888, p. 417.

† 'Revue de Chirurgie,' 1887.

‡ 'The Lancet,' March 7th, 1896.

cannula, and applying the exhausting bottle to the aperture. While I am ready to admit that this treatment might be applicable to small superficial abscesses, I should hesitate to apply it to deeply-seated collections of pus with loculi in the substance of the gland. I feel quite sure that the treatment of acute mammary abscess by the method of establishing a free opening anteriorly radiating from the nipple is essentially wrong. It leaves a scar on the front of the breast, and, what is of greater importance, it opens the purulent collection in a position the least suitable for drainage. As a consequence, many of these cases need several operations until drainage tubes are seen projecting through various openings, and very unsightly scarring results, with subsequent deformity and grave interference with the functions of the gland. In a considerable majority of the cases I have been able to collect, from the records of St. George's and other hospitals, several operations under anæsthetics were often needful. This clearly means inefficient drainage. I will now describe the method of treatment I have found efficacious in several cases, trusting that those who have extensive practice among parturient women will give it their careful consideration. So soon as elasticity and deep fluctuation are evident an incision is made radiating from the nipple just large enough to admit the index finger of the operator, and this is deepened until pus flows. The finger is now passed into the cavity, and in the vast majority of cases it will be found that the end of the digit may be brought fairly near the surface in a dependent position, and this is generally at the thoracic mammary junction. In this situation it may especially be noted that scars are hidden from view. Sometimes the finger passes towards the axillary margin, and occasionally the cavity is so large that a stout bent probe must be used to indicate the deepest part of the abscess. In this situation, the gland being well raised by an assistant, a free opening is to be made, large enough to well evacuate the pus, and the finger being now introduced through this the inferior opening, the operator will be surprised to find that the pus has burrowed about and is contained in loculi bounded by fibrous septa. It is especially noteworthy that in many cases quite a narrow channel towards the nipple connects the deep abscess with the more superficial collection of pus opened anteriorly, and it will then be clearly understood how inefficient is drainage in the practice of those who

are content with a small incision anteriorly in these cases. The remainder of the treatment is obvious; the cavity is well flushed out with whatever agent the operator fancies, and a full-sized tube is introduced from below. The opening made near the nipple is closed with fine horse hair and painted with collodion. It readily unites with only a faint scar, and the free drainage prevents the possibility of the re-collection of pus and a necessity for further operation. The tube, a large one, can be left in the cavity as long as needful, and is slowly shortened and withdrawn. It may seem superfluous to mention that the drainage tube should be secured with a piece of silk, but the fact of the tube having entered an abscess cavity and having been there retained or only removed by a troublesome operation must not be lost sight of. This accident may readily happen unless special care be taken. The unsightly scar is completely hidden by the position and volume of the gland above.

The treatment of chronic abscess of the breast is a matter of greater difficulty, and must ever raise differences of opinion. The importance of exploratory incision has already been raised, and I would here make a statement which may seem exaggerated, but which experience and a perusal of the literature of the subject permit me to positively advance. There is no symptom of scirrhous cancer of the breast which may not be simulated by a chronic abscess enclosed in a dense mass of inflammatory material, and unless exploratory measures are made as a matter of course grave errors of treatment will occasionally arise. The diagnosis of chronic abscess being established, one of the first thoughts which should arise is as to the presence or absence of tubercle. The thin and watery nature of the pus with the presence of caseating material in the walls of the abscess is one of the best naked-eyed tests that can be applied. Many writers seem to be in favour of removing the entire breast in cases which appear to be of a tuberculous nature. With reference to this very important point in operative surgery much will depend upon the extent of the disease. In disseminated tubercle, where several abscesses or masses of caseating material are disseminated in the breast, removal of the entire organ, with possibly the axillary glands also, is undoubtedly the right treatment to adopt. With regard to non-tuberculous chronic abscesses there is again no absolute rule. When the abscess is surrounded by tolerably healthy mammary

tissue and has moderately thick parietes, the free use of the spoon, with scraping and flushing and drainage in a dependent position in the thoracic mammary furrow, will give good results. But if the abscess, as in one of the cases I have related, is enclosed in a dense mass of inflammatory tissue infiltrating the greater part of the breast, and especially if the patient be at the age when scirrhus is frequent, removal of the entire organ is, in my belief, the wiser course to pursue. Regarding this question there is much difference of opinion. It is always most difficult in practice to determine at the moment what is best for the patient, and the operative treatment of chronic abscess of the breast is eminently one for consideration and discussion. I can only assert my belief that breasts are removed too frequently for these affections, and that free drainage in a dependent position with erasion and flushing will negative the necessity for the more serious operation in the vast majority of cases we meet with in practice.

Dr. Griffith, congratulating the author upon his paper, observed that the subject was one of great interest, though his own point of view was somewhat different from that of the author. His own business as an obstetrician was to prevent these inflammations, and he believed that great progress had been made in that direction. Modern methods of preventive treatment had proved very successful, and the number of cases of acute inflammation of the breasts had greatly diminished. Obviously the way to prevent inflammation of the breast was by the use of antiseptics. In the vast majority of cases the cause of the inflammation was infection consequent on some structural lesion of the surface rather than by infection through the ducts. Purely antiseptic treatment had been employed for some years past at Queen Charlotte's and other hospitals. In every case in which the nipple presented any sign of loss of epithelium it was washed after suckling, and dried and dressed with a large fold of cyanide gauze, the nipple being washed again before the child was put to the breast. Since that treatment had been instituted cases of inflammation of the breast have been exceedingly uncommon. The only new point in the surgical treatment which the author had brought forward appeared to be the proposal to close the first wound, the drainage being carried on through the lower wound. Personally, however, he had never seen two or three operations necessary in any case that had come under his notice. If each sinus were cut down upon and drained rapid recovery would follow. He doubted if the author's statement that the breast was nothing but a mass of specialised sebaceous glands was in accord with the most recent investigations.

Mr. Wallis said he had not gathered much in the way of novelty of treatment from the paper. He agreed that abscess of the breast was essentially a preventible thing, and the results of preventive treatment confirmed this view. In respect of treatment of mammary abscess during lactation, he had no objection to the closure of the original incision because it led to healing with but a slight scar. He had

found it very useful to scrape the abscess cavity with a blunt spoon, mopping out the cavity with perchloride solution. This method of treatment usually gave excellent results. He agreed as to the importance of the hour-glass formation in abscess of the breast, a fact he believed which was hardly mentioned in text books, and was by no means generally known.

Mr. McAdam Eccles asked the author whether he had ever seen any instances of gummata of the breast, and he referred to a case that had come under his notice some months since at the West London Hospital. In cases of intractable sinus after opening an acute abscess of the breast, the sinus ultimately became surrounded by much hard tissue, at the bottom of which might be found a cavity. He admitted that it was often difficult to recognise pus, and he asked the author how he proposed at an early date to determine the presence of pus in the deeper parts of the gland. If one waited until the pus approached the surface the destruction of gland tissue would be considerable, and the result was apt to be disastrous. He urged that a general anæsthetic ought always to be employed in order to allow of thorough treatment.

Dr. A. Routh said he had no doubt that the plan suggested by the author constituted the best possible treatment. He wished to emphasize the preventive treatment of these cases by the adoption of antiseptic measures. He mentioned that some years ago he had been in charge of an establishment where primiparæ were confined, and there he found that, owing to faulty nursing, abscesses of the breast were pretty common. He insisted on an antiseptic treatment, having the nipples washed with a solution of sulphurous acid after suckling. After that they had no further trouble of the kind. He then alluded to the irritating effects of pus in the milk on the children when, as sometimes occurred, the pus had found its way into a duct. He had also noticed vomiting and diarrhœa in infants quite apart from the presence of pus in the tubes. On examining the milk he had found it teeming with germs contained in the superficial tubules. Such cases were cured by having the first portion of milk drawn off by the aid of a breast pump before putting the infant to the breast. One means of preventing inflammation of the breast was equal pressure, preferably by means of a broad flannel binder, applied from behind, provided always that there was no pressure on the nipple itself or the neighbouring ducts. He mentioned that he had seen abscesses follow pressure on the nipple itself. He said, in conclusion, that if the author's paper only encouraged general practitioners to attend to the antiseptic treatment of the nipples it would prove the means of saving a vast number of cases which at present came under notice in hospitals.

The President observed that on looking over the statistics mammary abscess appeared to be common in puerperal mania, probably often as the result of injury to the breast to which such patients were exposed. He suggested that this might possibly be largely prevented by adequate protection of the breast in these patients.

Mr. Sheild, in reply, said he fully concurred in the importance of the preventive treatment to which he had alluded in the paper. He disclaimed any idea of novelty for his method. It was the plan generally adopted by hospital surgeons. The usual practice, however, was to make a small incision radiating from the nipple alone. When a small incision was made, the woman usually lay on her back and the pus then burrowed about and gave rise to great trouble. His object was to point out the wrongness of such practice, and to inculcate the desirability of making the

incision at a dependent part. He fully agreed with the remarks that had fallen from Mr. Eccles as to the impossibility of thoroughly evacuating the abscess under gas. He explained that Dr. Griffith's remarks as to the breast being not a specialised sebaceous gland applied more particularly to accessory axillary mammary glands which had been found to secrete odoriferous substances not secreted by sebaceous glands. He had not alluded to gumma of the breast because his paper was already quite long enough, and gummatous formations in the breast did not usually break down into abscesses but into sloughs. He had notes of at least four cases which he believed to have been gummatous in which there was the usual deep ragged cavity with overlapping skin and a grey sloughy base. The treatment of intractable sinuses of the breast was a question of great importance. The first step would be thorough scraping with cutting away of all overlapping skin, followed by complete rest of the arm. Unless this was done the movements of the pectoral muscles would keep a breast sinus open. Some cases, however, resisted this treatment, and in the more obstinate the best plan was to remove a wedge-shaped piece of the breast tissue, including the sinus and its surrounding hard tissue, bringing the parts together by deep sutures. As to the recognition of pus in the breast, if in a case of inflammation of the breast there was elasticity with œdema of the integument, he himself would not wait for fluctuation. In most of these cases pus would be found. He supposed that the presence of pus in the milk was not the cause in all cases of vomiting and diarrhœa in infants, but this cause was worth bearing in mind. He mentioned that he had only notes of one case of abscess of the breast in association with puerperal mania, but he admitted that such cases would not be likely to be met with in institutions to which he would have access. The remark of the President on this point was very instructive.

May 11*th*, 1896.

THE CONNECTION OF AUTOTOXIS WITH CERTAIN COMMON FORMS OF INSANITY.

By Allan McLane Hamilton, M.D.

Until quite recently the therapeutics of mental diseases have been very primitive, in view of the pathological advances that have been made in so many different directions, and do not appear to have been seriously influenced by the important researches that have marked the last decade, as far as deranged metabolism is concerned. Even to-day the management of insanity nearly everywhere consists chiefly in quelling excitement by narcotics, overcoming depression by stimulants and tonics, and affording rest, isolation, and protection.

I have for several years been impressed with the somatic origin

of various pyschosis, especially those which were first classified and defined by Krafft-Ebing, as "acquired," and by others ascribed to certain epochs, and I have looked for some more direct and reasonable causes than those which are ordinarily alleged to exist, reaching the conclusion that in very many instances the existence of defective oxidation will explain the clinical features of numerous insanities which were formerly roughly classified with regard to their mental characteristics alone, as mania, melancholia, dementia, or still further particularised by the names which defined their periodicity, or the crisis at which they appeared, or the element of hereditary pre-disposition; although in a few exceptions, notably hepatic and rheumatismal insanities, the somatic element has been recognised.

The defect of most classifications of an assigned etiology is that no serious attempt is made to satisfactorily connect the alleged cause with the symptoms and satisfactorily explain them. Granted that intrinsic defects, due to heredity, exist, no very clear or satisfactory explanation is given of what initial physical and secondary psychic disturbances follow. A great deal has been written about increased or diminished tension of the cerebral arterial system, but to those familiar with the exciting causes or pathology of insanity, the irregularity of cerebral hyperæmia or anæmia must be manifest. Why a periodical mania should develop, subside, and re-appear, the environment and other influences being unchanged during the entire course, has not been definitely explained. Why a confusional insanity most unexpectedly follows a surgical operation when there is little or no shock, or a form of puerperal insanity appears weeks after parturition, and when the danger of local sepsis has long disappeared, suggests the necessity of some fresh explanation.

Before going further in this direction it may be well to say that my desire for more exact knowledge in regard to the pathology and etiology of such everyday disorders as acute mania or melancholia, was stimulated by the experience common to most of us, that where psychic causes exist, not only the mental, but the physical disturbance is usually entirely out of proportion to any cerebral shock or demand upon the brain, and it seems strange that where the most extreme kinds of mental strain exist in some individuals, they are attended by comparatively little or no general disturbance. I was led to reason that if subjects who are

subjected to comparatively superficial mental strain rapidly develop great physical derangement, disturbances of assimilation, feebleness, and emaciation, and die in a few weeks, there must be something beneath all this—something that has been simply lighted up or induced by the preparatory condition into which, perhaps, hereditary influences entered to some extent, or not at all. The observations of Herter and Smith point to the fact that that protean neurosis, neurasthenia, is closely connected with some form of disturbed intestinal function, and Eccles and Gautier clearly recognised the insufficient activity in the oxidation processes with the presence of the products of incomplete metabolism, and with an increase of the combined sulphates in the urine. The excellent work of Bouchard, Rodriguez, Chardon, and Chevalier le Vaure, and the more recent papers in this country of Macpherson, Eccles, St. John Bullen, and Turner, have led to the enquiry whether a large number of acute insanities are really not after all due to primal intestinal disorders, and if even the course of the chronic psychoses must not be more or less modified by the same agencies: and whether, this being true, we should not in the future direct our treatment more than we have in the past to the care of the digestive organs, placing less reliance on the use of the conventional narcotics, or other familiar modes of treatment.

With this end in view I made many months ago a series of investigations, the results of which have been based upon experiments with animals, and clinical observations conducted in the hospitals and asylums with which I have been connected, and in my own practice and elsewhere. More than 50 cases of different kinds of insanity have been observed, which include examples of acute and chronic melancholia and mania, simple delusional insanities, primal and terminal dementias, paralytic dementia, periodic, puerperal, and traumatic insanities, and the alcoholic and drug psychoses. The variation of the urine and fæces was noted, and all the cases were carefully watched. It would be impossible in a brief paper of this length to more than summarise my results, and it is my intention this evening to simply sketch the work that has been done.

The experiments were undertaken to determine first whether there was any specific or noso-toxicity of the urine of the insane; and, if so, what the nature of such toxicity was; next to discover,

if possible, how important and general was the theory of uric acid poisoning, and again whether mental disorders were produced and modified by an autotoxemia; whether the offending substances were the leucomaines, or the intrinsic products of putrescence in the intestines. According to Marie and Bosc, the urine of insane persons possesses a toxicity which varies and is more or less identified with the different forms of insanity. They found that it was increased in agitated melancholia, as well as in persecutory insanity and excitable mania, while there was only a normal amount in quiet mania, and the toxicity was much reduced in purely stuporose and senile conditions. As the result of their experiments upon animals, hypertheremy and anesthesia, auditory hyperæsthesia, diminished reflexes, psychomotor disturbances and agitation ensued; but their conclusions, however, were doubted by Seglas and Ballet, who contended that there was nothing distinctive in the findings. For the purpose of satisfying myself as to the possible extent of noso-toxosis, I selected six patients, from whom the urine was obtained weekly, and conducted a series of experiments to determine whether there was any uniformity or peculiarity, but with negative results.

Rabbits were chosen and kept closely under observation for a number of days, and although some of them manifested rather striking nervous symptoms, as well as the hypertheremy observed by the authors referred to, the results were neither constant nor characteristic. Two of the patients whose urine was injected were melancholics, one was a case of acute mania, another of chronic mania, a fifth of paretic dementia, and the sixth of periodical insanity. The resulting effect seems to depend very much upon the increased specific gravity of the specimen, and on the evidences of intestinal disorders and malnutrition. The urine of the paretic was always exceedingly toxic, which property was possessed by that of the periodic patient, whose urine showed a large amount of indican, while in only one of the other cases of mania in which the specific gravity of the urine was high, was there any result effected by its injection. In these dense urines there was an increase of the combined sulphates and urea. Large quantities, amounting to 40 cubic centimetres of the urine of the melancholic, were injected without any apparent effect, so I was forced to abandon the idea that the excreta, in certain forms of insanity, presented specific toxic qualities. The only interesting

psychic manifestation, besides an apparent stupidity, was the causation, in the rabbit that had received the injection of urine from the paretic patient, of rather a curious condition, which led me to believe that hallucinations of vision existed. There was absolutely nothing, however, that could be regarded as uniform, although frequent injections were made. So far as the influence of uric poisoning is concerned, I am clearly of the opinion that it has not as much to do with the genesis of mental disease as is claimed for it by the more enthusiastic, but in those cases in which it is supposed to play an etiological part, it is a very grave question whether its presence is not indicative of another kind of poisoning, which is the result of the destructive metabolism of nuclein, the amount of uric acid measuring the amount of leucocyte activity, and we are confronted with the query whether the initial destruction is not due after all to a primary intestinal disorder. The symptoms produced by the injection of urea and uric acid into animals as detailed by Bouchard, though possessing a certain uniformity, have too limited significance in view of the varying symptoms which enter into the clinical picture of various insanities due to the absorption of putrescent substances. One distinguished writer has announced that melancholia especially is due to the accumulation of the second of these substances, and that one of its important features is the increased arterial tension, an assumption which I do not think is always tenable, though it may occasionally exist, for my own experience teaches me that there are many cases of this mental disease where the arterial condition is the reverse.

So far as the influence of retained leucomaines is concerned, there seems to be much more reason to believe that, in the subjects where there is the retention of the physiological products of waste, disorders of the nervous system generally ensue. Salomon has found that when paraxanthin was introduced into the blood stream of the smaller animals, states were induced resembling some of the psychoses observed in man, and I am informed that he has produced in a mouse a condition, so far as objective appearances are concerned, closely resembling stuporous melancholia. His experiments in 1892, and those of Mendel subsequently, prove that it was possible to produce symptoms similar to those of Katatonia by the injection of this substance into white mice, dogs, and cats. Vaughan injected a small quantity of hypoxanthin into a frog, which some hours afterwards became convulsed. Remembering

that paraxanthin and heteraxanthin are the organic analogues of the vegetable alkaloids, caffeine and theobromine—one being a dymethylxanthin and the other a methylxanthin—the natural speculation may arise whether the effect upon the nervous system of the latter might not be duplicated in the organic extracts, although Vaughan and others have concluded that the organic alkaloids obtained from ptomaines, or rather diamines, have not the identical physiologieal effects of such vegetable alkaloids as atropin, morphin, conin, &c.

At my request, Dr. E. E. Smith, of New York, prepared a quantity of hypoxanthin in the following manner:—

Liebig's extract of beef was dissolved in a large volume of water, and lead acetate added till no further precipitate was produced, the solution was filtered, the filtrate treated with hydrogen sulphide till the lead was precipitated, and this filtrate evaporated to a small volume and the creatine crystallised in the cold. The evaporation of the crystals was aided by the subsequent addition of several volumes of an 88 per cent. alcohol. The mother liquor, after removal of the alcohol, was precipitated with ammonia and silver nitrate, the precipitate dissolved in nitric acid of specific gravity 1·1 by the aid of heat, and the solution cooled, when crystals of hypoxanthin silver nitrate separated out. This salt was suspended in water, decomposed with hydrogen sulphide, and the filtrate evaporated to a small volume, whereupon hypoxanthin nitrate crystallised out.

Microscopical examination of the crystals of hypoxanthin nitrate showed the characteristic form with the exception only of one or two acicular crystals, doubtless mere traces of adenin.

With this product, I conducted a series of experiments on rabbits and monkeys. Hypoxanthin was mixed with the food and given in doses varying from 10 to 15 centigrammes at intervals of an hour, until 150 centigrammes were given, without any satisfactory results so far as the production of symptoms of any kind was concerned. Of four rabbits, one only presented toxic symptoms, and to a Java monkey as much as 50 centigrammes were given without any apparent effect. The susceptible subject was a lively nervous rabbit weighing $3\frac{1}{2}$ pounds, to whom 20 centigrammes were given in bran. Within five minutes after taking it, the animal manifested some excitement, rubbed its paws vigorously, and was restless and disturbed by noise or

jarring of the floor; its ears became exceedingly congested and its reflexes were affected by the slightest tap. This irritability gradually subsided, so that at the end of two hours it became dull and stupid, and did not resist pinching or other forms of stimuli. Its paws could be pricked with impunity and without any apparent evidence of feeling. Its pupils were widely dilated, and the pupillary reflex was lost, while there seemed to be retinal insensibility, for it did not mind a lighted match nor the application of an irritant. When with much urging it was made to move, it dragged its hind legs, and there was no effort to escape. It remained in a condition of torpor for over an hour and gradually resumed its normal condition of liveliness. The same rabbit subsequently manifested identical phenomena when 20 cubic centigrammes of a 50 per cent. solution were introduced into the circulation.

It would appear that the intestinal toxalbumens have more to do with the production of disturbance of the nervous system than the leucomaines, which undeniably have an effect, though not a very marked one. Selmi obtained ptomaines from the urine of a paretic patient which, when injected into an animal, produced convulsions, and according to Vaughan and others, most of the ptomaines produce convulsions and other forms of hyperkinesis.

A study of the cases that have formed the basis of observation for the past year unquestionably bears out the assumption that disturbances of the gastro-intestinal tract, more often than is generally supposed, are attended by bacterial necrosis and the introduction into the general circulation of certain very virile toxic agents whose effects are expended mainly upon the nervous system. I think I am safe in saying that nearly all the rapidly developing confusional insanities have this explanation, and we must, therefore, be on the alert for such a cause, even when the case has commonplace features. No other alternative has presented itself so strongly to my mind than that of intestinal putrefaction, and in all the patients whose urine was examined, a decided increase in the amount of indican was found, even when the diet was carefully regulated.

A sudden and rapid development of incoherence, then, with mal-assimulation, highly coloured urine, and delusions that are unsystematised, clearly suggests an enquiry into the condition of the organs of digestion, and the first step should consist in a

complete examination of the urine and fæces. Even in the chronic insanities the occurrence of *accès* and convulsions has, in my experience, been attended by some defect of metabolism, and the determination of the sulphate-ratio has afforded me great help in diagnosis.

Turner, in an admirable paper, determined that the ratio of the performed and aromatic sulphates in general paresis, while not very markedly increased in the early stages, becomes decidedly so in the established disease or coincidently with the *accès*, the ratio rising and afterwards subsiding.

It would appear, from my own cases, that those usually showing little or no excess of combined sulphates include examples of chronic delusional insanity, chronic melancholia, and some of dementia. In some individuals whose mental condition was one where imperative concepts played the chief part, the urine showed nothing that was unusual, at least so far as absorption of intestinal putrefactive products was concerned.

From the data obtained from all available sources, my own cases and others, it would appear that the ratio of the sulphates between themselves and to the urea, and the presence of indican in considerable amount, are indications of intestinal putrefaction, which no doubt not only influence the course of various insanities, but that a large increase of the combined sulphates has much to do with the genesis of various psychoses, and Bence Jones has noted this in delirium, while Regis and Chevalier le Vaure recognise the gravity of septic poisoning in other well-known mental conditions, but so far, though our knowledge is somewhat crystallised, the matter is still unsettled, and there is much to be learned with regard to the importance of the sulphatic ratio. My investigations convince me that the presence of indican in the urine of the insane has the most significance, so far as constancy is concerned, for in nearly all the cases, which were not simply evolutional, it has been discovered in excessive quantities, in connection with the development, or as a feature of an exacerbation of an existing mental disorder.

What is an excessive quantity? may be asked. The reply is: Any amount that can be detected in the urine by Jaffé's test, even if a weak reaction is obtained. Smith fixes the harmful amount at anything more than 5 milligrammes in 24 hours, and the colour may vary from a light pink to a deep purple. In two or three

of my cases the appearance of indican was nearly always coincident with the outbreak of new symptoms or the intensification of old ones, and it always marked the existence of a putrefactive process, bearing out the axiom that the presence of indol indicates bacterial death in the intestines. As regards the special connection of urinary findings of this kind with different kinds of mental disease, it would appear that in all forms with loss of weight and depression the sulphate ratio between the combined and preformed sulphates was lower than in health. It has been pointed out by Senator that an abundant appearance of indican under these circumstances indicates starvation, and, from the lower quantity of preformed sulphates found in cases of inanition, Herter and Smith agree with him. In melancholia especially, the amount of indican depends upon whether the disease is of the stuporous or agitated variety, the quantity of this substance found not being so great in the former. In one of the series of cases in Bloomingdale Asylum, examined by Dr. Dodd, it was absent only once in a series of 17 examinations, and always existed in large quantity with a corresponding decrease in the sulphate ratio, the latter varying from 1-2 to 1-12. In such cases of melancholia, the blood corpuscles and hæmoglobin seem to undergo a decided diminution, which has been observed in other conditions where anæmia existed in association with the increase of the combined sulphates, and the presence of large quantities of indigo blue. I believe it was the late Sir Andrew Clarke who first pointed out the connection between anæmia and the absorption of the products of intestinal putrefaction. In all the melancholic and other patients in which the coincidence existed, the variations in the hæmoglobin and red corpuscles were closely connected with the absorption of toxic substances, the extent of which was announced by the increase of the combined sulphates, while the physical appearances were those of malnutrition. Such a case was that of a young lady, whose feebleness and exhaustion were extreme, and were coincident with a mental condition, manifested by an initial neurasthenia with digestive disorders, depressing delusions, self-accusation, and attempted suicide. The hæmoglobin was reduced to 30 per cent., and the red corpuscles to less than 300,000. This state existed in connection with a low sulphate ratio, and a constant output of indican, notwithstanding the fact that appropriate diet was

ordered. The course of treatment, in which nuclein-forming agents and lavage and intestinal washing figured, cured her in two weeks, after arsenic and iron and forced feeding had failed.

Some forms of melancholia are undoubtedly due to autotoxis dependent upon impaction and copræmia, although the passage of an apparently sufficient amount of fæcal matter may incline the observer to ignore the existence of constipation as a cause. If the urine of such patients be examined, a large excess of aromatic sulphates will be found, with increased indigo blue and possibly skatol. Two such cases have made a great impression upon me, for the reason that, notwithstanding the passage of what looked like fair-sized stools, which to all appearance contained the recognised *débris* of food taken within 24 hours, such was not the case, and a certain accumulation existed which gave rise to a melancholia of an almost stuporous kind at first, but which subsequently became excited after a week or two, and was quickly cured by the recognition of the obstruction and its removal. In this case the increase of ethereal sulphates was enormous, the presence of indican being detected in large quantities. After the bowels were emptied and naphthalin given, the delusions, which were more or less systematised, quickly disappeared, and the urine became normal. It would seem that circumstances sometimes modify the course of a chronic melancholia, by favouring the increased elimination of more or less toxic products, so that an improvement in the mental state is witnessed, at least for a time. In a case reported by Eccles, an attack of influenza in a melancholic caused an increase in the elimination of urea and the leucomaines, with a coincident improvement of the mental depression, which, however, reappeared when the pyrexia subsided.

By far the most suggestive cases in which autotoxis from intestinal disorder plays a part, are those of acute excitement, especially where there is rapidly-developing incoherence and confusion. These, in my experience, have, as a rule, been associated with corresponding evidences of intestinal disorder such as have been described. Lively and generally fleeting illusions and hallucinations and delusions developing after insomnia, loss of appetite, and constipation; the delusions being unsystematised, are features, and if such derangement be con-

nected with urinary findings of the character I have mentioned, and the clinical evidences of physical disturbance, I think the intestinal disturbance may be always looked upon as a cause.

The more sudden and active are the manifestations when unsystematised delusions or hallucinations are expressed, the more positive are, in my experience, the indications of autotoxis. So characteristic, for instance, is the loquaciousness and incoherence, that Jacobson, who has described the toxic insanity of nephritis, has applied the name of "Verwirrheit" to the confusion which is almost allied to delirium. Acute hallucinatory insanity is often expressed by pseudaphasic confusion, and is often undoubtedly due to the cause I have mentioned, and there are even cases of extreme neurasthenia in which consciousness is more or less affected, and where there is no special delusional system. Occasional remissions of some duration are possible in these forms of general derangement, during which the patient recognises his false ideas and speaks of them. In some of these cases pseudaphasic confusion is expressed as the result of misleading auditory hallucinations which the patient is unable to correct. To the excited psychoses belong certain short-lived varieties of mental disturbance of this kind attributed to shock, and denominated traumatic insanity, in which such confusion is a characteristic. To this class belongs a case recently seen by me in consultation with Dr. Lusk, of New York.

The patient was a woman, 37 years of age, who went into St. Vincent's Hospital on January 28th, 1896. She had had some irregular menstruation with slight uterine hemorrhages between the menstrual periods, and once or twice in her life had had epileptic convulsions. The condition of the heart and lungs was negative. Abdominal and vaginal examination revealed the presence of a fibrous tumour, which was removed by operation on January 29th. On that day the temperature being normal and the pulse 90, but the urine had a specific gravity of 1035, and contained abundant urates.

After the operation no untoward results occurred until the next day, when there were restlessness, insomnia, flatulence, and a slight rise of temperature, which continued, so that on the evening of the 31st it had reached 103. She was troubled with abdominal discomfort, eructations of gas, and increased nervousness. The bowels moved for the first time on February 1st, the amount of

fæces being very small; on the 2nd the enema brought away a large movement. She became flighty on the evening of the 2nd, and developed delusions and terrifying hallucinations of a persecutory nature, the temperature meanwhile varied between 101·2 and 102, with broken and uneasy sleep procured only by morphine and chloral.

The urine was now superficially examined, showing an abundance of urates with high specific gravity 1025, no albumen, and sugar. Her incoherence almost amounted to delirium, and she cried, and was excited and anxious to leave her bed. For several days there was no particular rise of temperature, there being no greater advance than 102·8, with a corresponding rapidity of pulse. The intestinal disturbance still continued, and was very general. She did not recognise persons, but called them by wrong and fanciful names, and had no idea where she was. She had been fed with nutritive enemata and milk, and on the 14th a critical examination of the urine was made at my suggestion, which disclosed the following appearances :—

A moderately large amount of indican and a lowered ratio of preformed and combined sulphates; the combined sulphates measured by the Salkowski-Baumann method being 0·25 gramme, and the preformed sulphates 0·45 grammes in the urine of 24 hours, while the urea was reduced to 11·81 grammes in the same period.

The ratio uric acid and urea was 1–38.

Naphthalin was suggested and given in doses of 4 grains every two hours, being preceded by calomel and soda. Her condition, which had up to this time been almost continuously one of incoherence, promptly cleared up, and she but occasionally expressed delusions. The next day the temperature fell to 98·8, and remained normal thereafter. She recognised that she had been irrational, and after the 23rd there was little mental disturbance left, the specific gravity of the urine falling and showing a rapid decrease in all abnormal constituents, while her stools, which had been of a clay colour, were well formed and regular. The sulphate ratio became normal, and the total sulphates was properly proportionate to the urea; the ratio of uric acid to urea was 1–50.

Another case in which the condition of the urine bore a very close relation to the variation of the mental symptoms was that

of a young married lady, who upon two previous occasions, one far apart from the other, had manifested symptoms of an alternating character, there being usually an initial melancholia and succeeding light mania, which increased and had to be controlled by morphine and hyoscyamin. Her periods of mental derangement generally extended over several months, and seemed to bear close connection with a more or less profound disturbance of digestion, and were distinctly modified by the menstrual periods. The attacks of 1893 and 1894 were managed in the ordinary way, and there was a general amelioration of the symptoms and final subsidence, the convalescence occurring after removal from home. In 1895, after a protracted neurasthenia, she developed a maniacal condition marked by very great muscular violence, incoherence, and lively delusions, some of which were erotic and unsystematised. So extreme was her condition as to need the services of three nurses, and, despite their uninterrupted care, she became filthy and destructive, tearing her clothes, breaking such objects as she could lay her hands upon, and requiring dangerous quantities of hyoscine for the production of quiet. Her condition was exceedingly variable, and when she was not engaged in impulsively destroying things about her and assaulting her nurses, she scribbled and wrote incessantly, and there was almost constant verbergeration. Her bodily condition was one which gave me a great deal of worry, for she rapidly lost flesh, and this despite the fact that large quantities of food of a condensed and apparently suitable kind were taken.

Repeated examinations of the urine and the excreta showed a very decided disturbance of gastric and intestinal digestion, and her symptoms kept pace with the variations in these processes. Her mental state, which was most irregular and apparently uninfluenced by anything in her surroundings, revealed an interesting condition of affairs, which was so constant and consistent as to convince me that the insanity was kept up by the absorption of some toxic material. Her periods of excitement and confusion were always attended by a reduction in the amount of urine excreted, by an increase in the ratio of preformed and aromatic sulphates and indican, and by the presence of those signs of impaired digestion which indicated an intestinal putrefactive process. Certain psychical podroma of attacks after periods of comparative lucidity were nearly always immediately connected

with the presence of an increased sulphate ratio. At one time, before this connection was realised, the prognosis was exceedingly bad because of the extraordinary condition of physical exhaustion.

This patient had received up to this time nearly all the approved restorative agents and tissue builders that were available, and one-twelfth of a grain of the hydro-bromate of hyoscine daily. When this point was reached, the diet was restricted, nitrogenous substances being excluded as far as possible, and thorough intestinal disinfection was obtained by means of charcoal, salicylic acid, and the carbonate of guaiacol, the patient meanwhile being given large draughts of water, and her lower bowels flushed by the long rectal tube, with a mild solution of boracic acid. At regular intervals she took calomel purges, and a preparation of the red marrow of the small bones of the calf, to which reference will presently be made. The good result was almost immediate. Excitement subsided, and there was a rapid return of self-control, with the disappearance of the delusions, and a general subsidence of all mental disturbance. Continued and sufficient sleep was obtained for the first time in months, and the patient rapidly recovered. Within a few days after the intestinal antisepsis had been established, the urinary condition became apparently normal, the ratio of sulphates resuming its normal standard, and the specific gravity of the urine was promptly lowered, while the indican disappeared. A distinct and decided gain in colour and flesh was inaugurated, and in three weeks after treatment the red blood corpuscles had increased 50 per cent., while the percentage of hæmoglobin, as measured by the Reichert instrument, rose to 105.

The causation of puerperal fever by the death of the bacterium colli has been demonstrated by Budin, who has studied the febrile disturbance in connection with fæcal accumulation. Undoubtedly many puerperal insanities have some such explanation as this, especially those of the maniacal variety, which often develop in a very few days after parturition. A case I have recently seen was one in which there was absolutely no ascertainable local infection and in which there was no unusual rise of temperature, and a rapid recovery took place after the establishment of intestinal antisepsis.

Alcoholic insanity, as well as other forms, where acute or chronic variations prevail, must, I am convinced, be studied with regard to the conditions of the intestines, and it does not do to ascribe its

origin altogether to general exhaustion or to circulatory changes, or to the well-known effects of alcohol upon the nervous tissue, although undoubtedly all these conditions exist at some time or other, and in different cases play a part. If we stop a moment to consider the clinical features of acute alcoholic insanity, we shall find many of the symptoms of a rapidly developing toxemia, quite apart from that effect upon the nervous system which may be produced by the agent itself. The cerebral hyperæsthesia, rapid changes in perverted perception, the development of the peculiar hallucinations in which rotten substances, worms, bad odours, or other horrors appear, often figure; the hyperkinesis, cephalalgia, malaise, &c., and the antecedent history of gastric intestinal disorders, the presence of abundant aromatic sulphates, urea and indican in the urine, and possibly skatol, the foul small stools or diarrhœa, the final unstable and changing delusions, exhaustion and death, are suggestive. When we consider that the proteids have passed undigested through the small intestines, and have accumulated below, where they lie enfolded in a congested and feeble gut, it is not difficult to appreciate the fact that they form a rich field for bacterial attack, with the resultant introduction into the system of an amount of toxic material sufficient to produce a most serious change in the functions of the brain and cord. The alcoholic extracts of fæcal matter, according to Bouchard, are far more toxic than ordinary putrid matter, so it will be appreciated how readily skatol, indol, and other alkaloids of the fæces may be introduced in such quantities to do much mischief. The successful treatment of the cases of alcoholic insanity that came under my notice certainly goes far to strengthen this view.

The insanity developing after very acute diseases, especially influenza, is probably primarily dependent upon the intestinal congestion and derangement of the mucous membrane, whch is a part of the general disorder elsewhere, but in typhoid fever, where specific intestinal regions are attacked, it does not appear that there is any undue appearance of indol in the urine, although the appearance of post-febrile insanity in this disease would make this seem impossible, at least in a small number of cases.

The practical management of these cases not only includes the provision of an absolutely suitable diet, but the use of antiseptics, and recourse to mechanical means for the purpose of cleansing the gastric tract. That the lower bowel is the seat of infection

appears to be very well established by the experiments of Baumann, who found that when a fistula was made in the portion, which included the lower portion of the small intestine, there was a disappearance of the indol, phenol, and the other ethereal sulphates from the urine, but that when the intestinal contents were allowed to pass through the lower natural outlet, the putrefactive products were largely increased and their presence was again detected in this fluid. This discovery shows the necessity for thoroughly washing out the lower bowel from as high a point as possible, and a long rectal tube should always be used for this purpose.

McPherson's plan, tried with some success, consists in a recognition of the fact that when the antiseptic power of the acid of the gastric juice is impaired, there is an indication for the use of intestinal antiseptics with primary recourse to hydrochloric acid. McPherson resorted first to lavage, which was followed by a dose of calomel at night, a saline purge in the morning, and the subsequent administration of naphthalin in doses, at first of 30 grains daily, which were increased to 80 grains.

In my selected cases I used a variety of intestinal antiseptics, the list including naphthalin, salol, and the carbonate of guaiacol, charcoal, borax, and the salicylate of sodium. Several cases were put upon small repeated doses of calomel. These drugs were faithfully tried, and although with naphthalin I sometimes obtained excellent results, and in one case of traumatic insanity very prompt ones, I found that upon several occasions it gave rise to diarrhoea, great muscular weakness, and twice strangury, and the urine was coloured with hydochinon.

The administration of phenol, or its derivation, may, under some circumstances, mask the results of urinary examination, as was the case in a recent experience. The patient had submitted himself to treatment for a supposed tuberculous affection, receiving injections of a preparation which contained phenol and pilocarpine. A few days after treatment he became wildly insane, and attempted suicide. An examination revealed an entire absence of the preformed sulphates and indican, but a very large amount of combined sulphates. In this case the phenol entirely changed the urinary findings, as it always does. There was no intestinal disorder or there would have been indican, and the conclusion was reached that all the mental derangement was due to the pilocarpine.

Salol was unreliable and of slight service, and was often passed in an unchanged condition in the fæces.

Even with this drug administered in large quantities, it was apt to be found in small round balls in the fæces, and it is therefore recommended that all intestinal antiseptics should be given in small and repeated doses.

Naphthalin, if administered in capsules, which, as a rule, is necessary because of its offensive odour, is sometimes passed in an unaltered state. My experience is that of Herter and Smith, that there is no agent which approaches salicylate of sodium, so far as its antiseptic advantages are concerned, and I have given it in from 10 to 15 grains, thrice daily, and found it of especial value in melancholia and other insanities where the cerebral condition is one of anæmia. The use of this drug, which produces a condition of increased arterial tension, is rather against the theory that uric acid produces cerebral symptoms, for not only is it of service because of its antiseptic action, but in the anæmic brain of melancholia it certainly brings about an improvement through accession of new blood and nutritive material.

In insanity of a toxic nature there is, as we know, a destruction of hæmoglobin, and a very greatly reduced number of red corpuscles. This condition of affairs is not only met with in the acute insanities due to the absorption of putrefactive products of intestinal indigestion, but in old insanities as well, and Johnson-Smyth found the red corpuscles reduced to 4,070,000, and the hæmoglobin to 50 per cent. in the case of secondary dementia.

So far as the nutrition of the individual is concerned, I have had the best results with a combination which is a rapid producer of nuclein, and when we appreciate the fact that in the majority of these cases there is a destruction of the colouring matter, as well as other blood elements, the provision of some agent rich in this substance is an absolute necessity.

Remedial measures of this kind consisted in the use of a combination of a glycerine of the red marrow of small bones with bullock's blood, the amount of glycerine being regulated both in quantity and temperature so that coagulation does not take place during its preparation. With this preparation I have been enabled to prevent waste, and build up my patients much more

rapidly than with any of the other more popular restorative agents, and its use at two of the large Hospitals for the Insane in New York was attended by an increase of red corpuscles to the extent of 50 per cent., and depressed states were quickly helped.

The possible conclusions are, I think, the following :—

1. Urines rich in indican contain very little or no performed sulphuric acid, and are toxic.

2. When the sulphate ratio is materially changed, it is likely to indicate autotoxis in connection with an increase in the amount of combined or ethereal sulphates.

3. Such indications are generally found with acute insanities in which rapidly developing symptoms occur.

4. Fugacious and changing illusions and hallucinations, unsystematised delusions, confusion and verbigeration in connection with insomnia, pallor, intestinal indigestion, constipation, and rapid exhaustion are due to autotoxis.

5. Paranoic states, or those in which concepts are the features, chronic stuporous conditions, and certain forms of dementia have little to do with the formation of intestinal products of putrefactions.

6. Various post-febrile, traumatic, alcoholic, or drug insanities are those in which autotoxis is most constant.

7. The variations in the excretion of combined sulphates keep pace with the changes in the progress of an established insanity, *accès* and epileptiform attacks being directly connected with putrefactive processes.

8. The most successful treatment consists in lavage, intestinal douches, gastric and intestinal antisepsis by means of hydrochloric acid, borax, salicylate of soda, charcoal, guaiacol, or naphthalin in small repeated doses. The administration of a combination of the red marrow from the small bones, blood, and glycerine.

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The PRESIDENT congratulated the Society upon the presence of so distinguished an authority as the author, a courtesy which he hoped would be reciprocated by the reading of a paper by an Englishman before the Academy of Medicine of New York at some future date. He recalled the excellent work done by the author during the last 20 years in the department of medicine with which he himself was most associated. The paper opened out new and original ground, though he supposed the author himself would admit that much of it was speculative. Many of his conclusions, indeed, could not at present be implicitly received and accepted, and autotoxis would not drive out of the field all the older methods of dealing with this class of cases, though it might prove a valuable help

in treatment. He recalled the fact that Dr. Lauder Brunton had pointed out the resemblance which exists between the languor associated with indigestion and the effects of curare poisoning, and that he had suggested that these symptoms might be due to the absorption of poisonous matter from the intestines, probably of the nature of ptomaines. It was only necessary to suppose an excessive production of these ptomaines or their imperfect destruction by the liver, which, under ordinary circumstances, prevented them reaching the circulation, to understand that this failure to protect might have far-reaching consequences. They had only to imagine this to see that in the long run a condition might be engendered which might culminate in melancholia with stupor, evidently strictly analogous to the autotoxis to which the author had invited their attention. That the production of these bodies in the intestine might be enormously increased in certain states had been clearly demonstrated, and he himself was inclined to believe that their presence in excess in cases of intestinal catarrh might readily give rise to the mental consequences associated with this condition. He pointed out that there was a well-known type of hypochondriacal melancholia associated with catarrh of the transverse and ascending colon in which the mental characteristics were out of proportion with the lesions, cases in which there was no family history, and the symptoms yielded readily to a visit to Carlsbad or Marienbad. He had often thought that the symptoms in these cases might be due to excessive production of ptomaines in the intestine or to their imperfect destruction by the diseased liver. The possibility of putrefactive changes in the intestine and the consequent production of ptomaines were, of course, very great and very varied. He mentioned that according to Mr. J. Murray, of the British Museum, there were 128 genera of microbes and 169 fungi which thrived and flourished in fæcal matter, many of them were peculiar to particular kinds of fæces, 45 to the horse, 35 to the dog, 28 were peculiar to birds, and 21 to the fæces of man. It was clear, therefore, that fæces afforded a very favourable and congenial nidus for fungoid and bacterial growth, and any change in the physical contents of the lower bowel or any change in their environment interfering with the fungoid struggle for existence, by giving advantage to one variety, might allow of the production of an excessive amount of certain poisons, followed by symptoms of poisoning. He asked whether the brain itself might not provide poisons, seeing that poisonous ptomaines had been proved to develop in cerebral matter after death, and it was possible that under certain conditions of malnutrition similar products might be produced at an earlier period. Muscles were known to develop various alkaloids during life which might, under particular circumstances, even determine a fatal effect. It was also worthy of consideration whether the epileptiform seizures which chequered the course of the later stages of general paralysis might not be due to autotoxis. There was a gradual degradation of nutrition and possibly incipient decomposition of albuminous tissues which might produce substances acting as poisons on the nerve cells, producing a special train of symptoms along with a rise of temperature. Selbing had shown that ptomaline was found in the general paralytic and in pneumonia, and one was familiar with the fact that washing out of the lower bowel was often the means of arresting the epileptiform attacks which characterised the later stages of general paralysis. He supposed the author would admit that the subject was at present better fitted for the laboratory than for academical discussion. His title, indeed, was very

comprehensive, for it might be made to include all forms of moral and intellectual auto-intoxication, a phenomenon which resulted from undue egotism and the concentration of the energies on selfish or degrading objects. Ideal microbes and emotional ptomaines would lead them too far afield, and he would, therefore, not enter upon their discussion.

Dr. HAIG said it was now nearly eight years since he had first called attention to the presence of an excess of uric acid in the urine of cases of mental depression and of epileptic convulsions, &c., and he was still of the opinion that the symptoms in such diseases, now referred by some to intestinal putrefaction, were really due to the presence of an excess of uric acid in the blood. The uric acid altered the circulation throughout the whole body; the altered circulation in the brain accounted for the mental symptoms, and that in the stomach and intestines caused putrefaction to take the place of digestion. He had been much interested in what the author had said about the beneficial effects obtained by the use of calomel, because calomel cleared the blood of uric acid. It would, therefore, tend to prevent the modification of the intestinal circulation, which was the cause of the putrefaction. Salicylate of soda also cleared the blood of uric acid and so prevented its exerting its usual effects. In one of the cases on which the author had laid considerable stress, he noticed that the patient got better when the regimen was changed, but they had not only changed the diet but given antiseptics and washed out the intestines as well. He had laid great stress upon these things but had said little about the diet. His own idea was that they gave far too much nitrogenous food, and when this was discontinued and the introduction of uric acid put a stop to, the patient got well. Many patients suffering from mental disease had been cured simply by diet, without any attention being paid to intestinal putrefaction. The points about uric acid which he wished specially to bring to the notice of those interested in mental diseases, were the well-marked clinical signs of its excess in the blood, viz., high blood pressure and scanty urine. In some of the author's cases he had noticed scanty urine, and this no doubt meant an abundance of uric acid in the blood. If they controlled that either by diet or by drugs, they would control the circulation and the mental disease.

Dr. ANDRIEZEN said there was no doubt that one source of the poisons which generated insanity was inside the body during life (poisons of endogenous origin). From bacteriological study we knew that actual toxins could be obtained from the cultures of various pathogenic bacilli—such as those of cholera, typhoid, tetanus, &c., which, injected into the body of man or animals, produced the special and characteristic phenomena of the disease in question (Koch, Pouchet, Brieger, and others' researches). Referring to the intestinal poisons arising from constipation, it was well known that in those accustomed to a *daily* evacuation of their bowels, a comparative slight delay (a few hours to one day) was sufficient to bring about headache and depression of spirits, which immediately passed off when the bowels were relieved. The mere retention of fæcal matter, even for a few hours, permitted of the passage of a certain quantity of poison into the blood. He found it difficult to explain this circumstance on the hypothesis of uric-acid formation. An excess of uric acid would doubtless also give rise to much the same effects, but the rapidity with which the effects followed mere fæcal retention showed that the source of the symptoms must be referred to the intestines. It was very important also to bear in mind what Dr. Lauder Brunton had shown, viz., that a great amount of toxic matter might be produced from

disorder of the stomach, as in various gastric catarrhs. Dr. Andriezen mentioned certain cases of hysteria with dilated stomach, in which washing out the stomach and giving small doses of naphthalin (5 grains) had brought about a very prompt recovery. Of course, other cases of hysteria, those with a different pathogenesis, did not react to this kind of treatment. In the cases of hypochondriacal melancholia without neurotic taint or history he could bear out what the President had stated, and he believed that these belonged to much the same category as the hysteria noted above, only the changes were more extensive and severe, and the mental symptoms correspondingly increased. Toxic absorption from the gastro-intestinal tract, with or without morbid changes in the portal blood, could produce chloroses and anæmias of various degrees, and in some cases of pernicious anæmia such poisons (different diamines) had been found in the fæces by Hunter. The sluggish movements in the gastro-intestinal tract and its lowered vitality in melancholia favoured the development of ptomaine-producing micro-organisms. Such cases showed an increase of the aromatic sulphates in the urine—a good index of the amount of intestinal putrefaction going on. In epilepsy and in general paralysis the accumulation of such toxins in the blood favoured and brought on convulsive attacks. The tendency of chronic Bright's disease to intensify existing symptoms of toxæmia and even to favour acute convulsions (*i.e.*, poisoning of the cerebral centres), as in pregnant women, was pointed out, and the importance of it in the clinical course of certain insanities emphasised. He was unable to agree entirely with Dr. Hamilton, that nearly all the rapidly-developing manias and insanities, with hallucinations or acute mental confusion, were of autotoxic origin. In many such cases quite other and adequate causes could be easily ascertained ; though errors of diet and digestion, neglect of the bowels, and consequent auto-intoxication from the intestines, might play a minor part. He was chiefly impressed with the frequency with which such autotoxis might occur, and thus aggravate the symptoms in *already established* insanities, such as general paralytic, epileptic, alcoholic, and slowly-developing delusional insanity. The clinical phenomena in these cases were a slight subacute delirium with restlessness, the patient stumbling and fumbling about in his room, with insomnia, which did not react to the usual sedatives and hypnotics, and where the temperature was slightly raised, the tongue furred, the breath offensive, and the skin and flesh peculiarly liable to undue markings like bruisings, even from mere restlessness and the pressure of garments alone. Where he had examined the urines in such cases (about nine or ten cases) he had noticed considerable excess of indican, as compared with the same case after such a delirious episode in the course of the insanity was over. Such cases reacted well to brisk purgation and enemata with a predominantly farinaceous and milk diet : calomel was excellent for the former, and it could with advantage be administered with a capsule of naphthol. Personally he had great faith also in capsules containing pure carbolic acid, given between meals if gastric fermentation co-existed. He referred to an important class—what he would call a diathetic class—of the insanities which the text-books as yet had not recognised. He did not refer to the so-called gouty or rheumatismal insanities, but to those associated with and growing in the soil of myxœdema and acromegaly, with a very constant and distinct physiognomy of their own, and with a pathogenesis that could be harmonised and well explained by the morbid changes present, changes which lay at the root of the mental as well as the bodily

conditions. In the one case (myxœdema), a morbid process starting from the thyroid gland affected the whole capacity of the blood in regard to its power of taking up oxygen from the air. On examining the blood with the mercurial pump it was found that its gases O and CO_2 were much diminished, and by placing the individual in the apparatus for examining the gases of respiration, it was found out that he took in but little oxygen and correspondingly gave out but little CO_2 during life. Thus he suffered from weakness and dulness, from sub-normal temperature, and from a tendency to the accumulation of incompletely oxidised bodies (fat, &c.), in his tissues. Similarly in the insanity of acromegaly pituitary feeding gave corresponding benefit, and for those who cared to follow the function of this gland and its special relation to the brain and nervous system, he would refer to his paper on the pituitary, published in the 'British Medical Journal,' January, 1894. Finally as to toxins formed in the central nervous system, this possibility must not be overlooked. Toxins may form in muscle and gland from the chemical products generated during the activity of such tissues, *e.g.*, CO_2, lactic acid, kreatine, &c. Now in the central nervous system there was a very complex lymph apparatus for the absorption, carrying off, and elimination of these metabolic waste products. The whole nervous tissue of brain and spinal cord and the sheaths of the cranial and spinal nerves were perforated by a system of lymph channels, which in the brain cortex itself formed a special prolongation around each of the larger nerve cells (pericellular lymph sacs), and which had peculiar relationships with the adventitial sheaths of the pia-arachnoid and intra-cerebral blood vessels. In the general paralytic and in the chronic alcoholic these lymphatic structures were affected in a special and peculiar way, producing in places blockages of the lymph streams and overgrowth of these lymphatic (lymph-secreting and lymph-absorbing) cells, which, according to their local incidence and preponderance, affected different spots, centres, and tracts of the central nervous system. An associated paresis of the muscular coats of the blood vessels followed by fusiform and ampullary dilations of the vascular and lymphatic channels also co-existed and added to the complexity of the morbid involvement, and this apart from changes which took place in the dynamic connections of nerve cells (dynamic changes) and in the internal nutrition of the cells, bodies, and protoplasm (nutritive changes). The products of metabolism of the nerve cells would thus be in places retained in the dilated or obstructed sacs and lymphatic channels, producing from time to time, *i.e.*, continuously or cumulatively, various symptoms of toxis; the toxin being in such cases the unescaped, uneliminated products of cell activity. He concluded by stating that more often than not toxic agencies played a part in the *course of an insanity which was already established;* in a small number they played a *truly causal* part, but that in any case they should be vigorously treated when indications of their presence existed, the treatment being lavage or enemata, purgation with calomel, and antiseptic drugs taken internally; while to aid the convalescent stage and its associated anæmia iron, extract of bone-marrow, &c., were indicated.

Dr. HARE said that, in listening to the paper, he had been struck by the fact of the large amount of knowledge the ancients possessed on the subject-matter discussed by the author. The central point insisted upon was that of self-poisoning, in relation to mental conditions; in other words, the connection between such states of the mind and of the nervous system, and the processes of disintegration and disease within

the body. But the physicians of 2,000 years ago were well acquainted with these facts, and they used such terms as "melancholia" and "hypochondriasis," "black bile," and "under the cartilages," showing that the Greeks well knew the relation between mental disturbances and affections of the liver. But the physicians of the present day had demonstrated what was previously only known as the result of clinical observation. There was nothing of which he was more sure than this self-poisoning, not only in insanity, but in many other conditions; and doubtless they would sadly neglect the treatment of many cases of insanity if they did not pay attention to the condition of the digestive organs. He was glad to hear the author insist upon the value of calomel and purgatives.

Dr. THEODORE WILLIAMS observed that in this country one ought not to suffer so much from mental and other diseases due to defective excretion, because great attention was usually paid to regularity of bowels and the proper function of the skin. On this ground, if the author's hypotheses were correct, such mental disturbances ought to be much more common in countries where it was quite common for persons to have an action of the bowels only once a week, and then only from purgation, and it was well known that the skin was not so well looked after there as here.

Dr. BOWER suggested that probably the intestinal trouble was more often the result of the nervous trouble than the cause. In respect of alcoholic insanity, it was said that the neurosis made the patient drink, and the drink reacted on the neurosis. He thought that washing out the stomach and intestines was of the greatest possible advantage.

Dr. FORBES WINSLOW observed that the subject was a very difficult one unless one had practical experience in a large institution. Patients in private practice did not afford sufficient opportunities to justify them in coming to any conclusion on the subject. As, however, the question was being raised in the House of Commons as to the increase in the prevalence of insanity and its causes, it was a great thing to have a paper like the one to which they have just listened. The mention of the influence of uric acid in the system reminded him of a case of a man suffering from gout who had melancholia with monomania. After a time the presence of a stone in the bladder was made out, and on its removal all his delusions disappeared.

Dr. HAMILTON, in replying, thanked the President for his kind words of welcome and wished to say that his paper was simply suggestive of the vast possibilities of the subject. He had recognised the conditions so clearly enumerated by Sir J. Crichton Browne, which all played an important part in the causation of mental disease, and he proposed at a future time to publish further details of his investigations. The criticism of Dr. Haig, whose views of gout are so well known, the speaker was disposed to regard as extreme in the present instance, and while he recognised the fact that increased uric-acid excretion was found in many nervous disorders, he regarded these phenomena as the result of intestinal derangement such as he, the speaker, had demonstrated, rather than the initial cause, and he referred to Dr. Haig's own writings in regard to the transferal of cerebral and joint symptoms as an illustration. While he recognised the importance of the study of insanities associated with myxœdema and acromegaly, and the formation of certain alkaloids in the nervous system, he did not feel that the scope of the paper permitted him to go into this question, which seemed to have been so diligently studied by Dr. Andriezen. As to the query of his friend, Dr. Theodore Williams,

regarding the antipathy of the French to water and to the carelessness regarding the ordinary functions of nature and their relation with Gallic insanity as compared with the better habits of their Anglo-Saxon neighbours, he had his own views. In conclusion, while disclaiming any dogmatism, he still would insist that in most cases of suddenly developing acute mania, and especially such forms as the puerperal and periodic varieties, the existence of intestinal autotoxis could be very often found.

May 18th, 1896.

THE ANNUAL ORATION—"THE BREAKING STRAIN."

By W. H. Allchin, M.D., F.R.C.P. Lond., *Honorary Librarian to the Society.*

Mr. President and Gentlemen,—Among the many and varied phenomena presented to our observation by living beings, there is no one that recurs with such persistent frequency, no one that our experience leads us so inevitably to anticipate, as that such a being will in time, whether long or short, cease to exhibit those manifestations in virtue of which we speak of it as living, or, in other words, will die. It has seemed to me that I might, and I hope without too great presumption, profitably occupy the occasion which the courtesy of the Council of this Society has extended to me in putting before you some considerations which are connected with the investigation of this problem. A fundamental explanation of it I do not pretend to—that were impossible, as impossible, indeed, as it is to affirm the "why" of any other "of the sense impressions distinguished by our perceptive faculty." But it at least is as capable of scientific treatment as other phenomena, whether they be associated with living or non-living material. And the collection and classification of the facts connected therewith, as well as the recognition of the sequence and relative significance of these facts, are as much called for and as reasonably to be expected as in any other problem of natural science.

The immediate practical bearing and importance of so difficult and recondite a question in physiology may perhaps be far to seek, even for a body of medical men actively engaged in the

practice of their profession and eager to avail themselves of any new weapon that science may furnish them with in their contest with disease. But I think now and then a short time may be advantageously spent in the consideration of subjects which, though not of immediate practical use, do seem to furnish some principles of general application, and to suggest some lines of coherence among the many scattered and apparently isolated observations which we are so constantly recording. It is pleasant occasionally to dissipate in generalities, to see what bearing phenonema may have to one another, and indulge therein by way of relaxation from the laborious accumulation of individual facts. The Medical Society, no less than other societies which claim to be scientific, regards, and properly regards, with some hesitancy of approval, the time devoted to theory and speculation. But we have to-night reached the end of an active session, and the knowledge of this, as well as the recollection that my present contribution is not followed by discussion, has led me to take, not, I hope, an undue advantage of your forbearance, by offering some remarks upon a subject which, I fear, may have been already dubbed by some of you impractical and transcendental.

It will be well to obtain at the outset as complete an objective conception of the phenomena as we can—to ascertain and realise, as far as possible, the facts of the case. To begin with, it is clear that we mean by death a condition of matter when it has ceased to exhibit any of the properties which we call living. For a thing to be dead implies, properly speaking, that the thing has lived, and the term is inapplicable—or should be, were we precise in our language—to material that has not been just previously living. It will be impossible, therefore, to enter on the consideration of death without some preliminary agreement in notion of what is meant by life, which, after all, is only another aspect of the same problem.

Conformably to the principles of modern science, we seek—*pace* the new vitalism—to refer the investigation of "vital phenomena to their physical and chemical counterparts or analogies"*—to refuse, in fact, to consider vital problems as understood that cannot be measured by the standards and methods employed in the investigation of physical and chemical manifestations, fully

* "Ludwig and Modern Physiology," by Professor Burdon Sanderson, F.R.S. 'Science Progress,' March 1895.

conscious that our results merely end in description and not in explanation, and result only in ranging our "perceptual experience" within the scope of postulated natural laws, and not pretending to assert a supersensuous causation. It is also obvious that, to form any idea of life and its correlative death, it will not suffice to confine one's attention to the higher animals and plants, still less to man only, but that to obtain a thoroughly comprehensive notion, the investigation of the simplest forms of both kingdoms must be included, and so, by excluding the highly specialised functional manifestations exhibited in the most developed, ascertain what is common to all from the simplest to the most complex, thereby reducing the phenomena to their simplest terms. So regarded, we find that the essential facts of vitality, as ascertained by observation, experiment, and experience, are:—1. The invariable presence of a certain material of very easily recognised physical properties, but of a highly complex but as yet undetermined chemical composition and molecular structure, known as protoplasm, which recent investigation has tended to show is not so homogeneous as was originally thought, though the details of its arrangement the microscope as yet has imperfectly revealed. 2. Such material occurs in isolated and distinct particles of exceeding minuteness, probably always, even in its simplest form, differentiated into cytoplasm and nucleus—the cell; or as aggregations of such particles, frequently in association with other materials less complex in composition and not possessing the properties we call life. 3. Given this substance, we call it living when it exhibits certain special forms of energy to which the collective term "irritability" may be applied, or more specifically, "contractility," "nerve power," and "secretion." They are accompanied invariably by the liberation of heat and probably always, certainly often, by electrical manifestations, both of which are identical in nature and measurable by the same means as the heat of our fires or the electricity produced by our batteries. I am not concerned now to discuss how far these living energies are mutually convertible, or whether they are or are not correlated to the associated heat and electricity; it is sufficient to say that matter which presents these characters is called living, and unless they be present life is absent. Further, it would seem that for their manifestation there must be some immediate antecedent existing agent, some stimulus, whether that be of a gross and

obvious character brought to bear from outside or more subtle and obscure arising intrinsically. For the display of these properties and essentially included in the conception of life, is the presence in the cell of an adequate supply of non-living material—food, whereby its nutrition, as we say, is maintained. Regarded more closely, the three-fold functions above enumerated are the outcome of, or the expression of, protoplasmic nutrition, and as they are the essentials of vitality, nutrition and life may be to that extent regarded as synonymous terms. So far what I have said is within the range of verification by observation. The simplest speck of living matter, call we it animal or plant (or multiply the difficulty by speaking of an intermediate group, the Protista), equally with the highest known organism, may be seen to move, not infrequently in a manner strongly suggestive of purpose, to avoid or pursue in its movements this or that object, to engulph other material upon which it feeds and upon the presence of which its continued existence as living matter is absolutely dependent. Equally is it known by observation and experiment, no less than by experience, that the manifestation of life is subject to certain conditions of the environment of the cell, conditions that are familiarly known as temperature, moisture, sunlight, and atmosphere, including a due supply of oxygen and the like, certain degrees of which are favourable, as others are fatal, to the vitality of the protoplasm. Experience provides us with no knowledge of vitality apart from these conditions, and the vital phenomena we are familiar with may be regarded as the resultant of these external influences brought to bear upon the nutritive changes taking place in protoplasm. But just as for purposes of clearness of thought and to obtain the desired objective conception of our subject we consider the intrinsic protoplasmic changes apart from the influence of the extrinsic environment, so we have further to recognise that the range of variation within which the latter is consistent with life is very considerable, and that the living protoplasm has a considerable range of adaptability by which it adjusts itself to altered conditions. This power of adaptation we are in the habit of regarding as an inherent property of living matter, a factor of its vitality, just as the power of self-nutrition and the manifestation of irritability are other factors, all inextricably involved, and perhaps but different aspects of one and the same. If to these qualities be added the tendency to

death which sooner or later asserts itself, we have a summary of the characters by which we affirm that a given object lives.

It is necessary to consider a little more in detail what was just now spoken of as nutrition, to ascertain, as far as may be, the intricate nature of the processes therein included as bearing on their relation to the particular subject of my present remarks. That the living being is dependent on food, that this food undergoes certain changes in the living tissue, and that certain waste products of such changes are thrown off, are among the commonplaces of our experience, and are questioned by none, any more than the fact that, associated with this continuous ingestion, change, and excretion, there are evolved certain energies, some of which are peculiar to living substance. Indeed, so precise is most of our knowledge on this point, that what has been called the balance-sheet of energy, in which the work done by the body (in this case the body of some one of the higher animals) is accounted for by the food-stuffs used, has been prepared with such an approach to accuracy as to justify the expectation that it will ultimately be capable of being presented in such a form as to satisfy the most critical physiological auditor. But beyond such a view—a very superficial view—of the question, there remain deeper aspects of the problem, where we are not nearly on such firm ground, and where hypothesis and conjecture do duty at present for more positive knowledge; but so long as these hypotheses are admitted as such, and are in harmony with, or at all events not flagrantly opposed to, other fundamental concepts, we may claim to be pursuing the right path, at all events for the present, and until we are brought to a stop by the proof or even strong probability that our assumptions are erroneous. It is in respect to the exact relationship which exists between the ingesta and the living elements of the tissues in the course of those changes which eventuate in the liberation of vital energy that conjecture prevails, and, as may be supposed, no single hypothesis is wholly accepted. Are we to consider that the living protoplasm, whatever may be its ultimate structure, behaves as regards the pabulum supplied to it, as does a piece of machinery, say a steam engine, where the water and fuel are so disposed as to furnish steam power, with the result of a slight wear and tear of the mechanism and a discharge of waste in ashes and smoke, and that the machine is merely a suitable arrangement for effecting

the required changes in the material consumed, itself undergoing no—or practically little—alteration in the process? The relationship of the living structure (mechanism) to its fuel seems scarcely so simple as this; some at least of the food-stuffs duly elaborated in the processes of digestion, in the lymph and blood channels, and, possibly also in the liver through which they pass before reaching the tissue elements, would seem to be incorporated in the very tissue itself, to form an integral part of it, to be raised up to that height of molecular complexity and corresponding instability which pertains to the living particle, which is no sooner reached than it over-topples, so to speak, to be as continuously replaced, falling from the zenith of complexity to some more stable construction, disengaging energy in the change, and so passing from the pinnacle at which it may be pronounced living, which is no sooner reached than it breaks down into the condition again of non-living matter from which it had just been built up. In such a fashion it may be conceived that this living material is maintained, that the progressive stages of construction (anabolism or assimilation) passing over at a certain point, as yet not grasped, into a re-arrangement of molecules of the destructive or catabolic order, constituting thereby a perpetual succession of interchanges, a "cyclosis in which the organism returns after every cycle to the same point of departure, ever changing yet ever the same"*—in fact, life itself.

It would seem that but a small proportion of the nutritive ingesta is destined to actual living tissue construction, and that proportionately only a little of the total resulting vital energy is associated with the interchanges here postulated; but no hypothesis, as far as I am aware, has yet ventured to suggest exactly which of the specific energies are thus liberated, or, indeed, how far, if at all, they are independent of the probably less complex interchanges which take place in that major portion of the ingesta which are regarded as never becoming actual constituents of tissue, but which consist mainly of an oxidation process carried out within the range of influence of the protoplasmic metabolism. The terms "fixed" and "circulating"—the former singularly inapt—have been used to denominate these

* Address in the Section of Biology at the meeting of the British Association for the Advancement of Science, 1889, by Professor J. Burdon Sanderson, M.D., F.R.S.

two varieties of food as it finally reaches the tissues. Such, then, in summary, is what we mean by life, the processes of which are the subject matter of the physiologist's inquiry, to become the province of the pathologist when they overstep the ill-defined line which separates health from disease. By experiment and observation, constantly aided by the progressive advance of chemistry and physics, is our knowledge becoming more accurate and precise. But at the beginning and end of the subject, so to speak, are questions to which as yet but the most uncertain answer can be offered. Given the living protoplasm, given this material with its vitality, how has it come into being, how does it come to an end? With the "why" as an explanation true science has no concern, but the "how" is its legitimate scope of inquiry. Different as these questions may be at first sight, they are not, I venture to think, as different as they may appear to be, and I suspect any knowledge of the one will materially assist to a comprehension of the other.

Before proceeding to consider the nature of death, what is implied by it, and how it comes about, it is worth while to inquire whether death is an invariable termination to life, whether, in short, every being that lives does sooner or later die. If we confine ourselves to the higher forms of life the reply would undoubtedly be "Yes," but this cannot be so readily affirmed if we regard the simplest forms of existence. Here we note a close connexion between the mode of origin of life and the conditions of its termination. Universal experience shows that such beings as propagate sexually, whether animals or plants—or, in other words, beings which originate from the union of distinct sexual elements, and themselves consist of aggregations of cells and cell derivatives resulting from this union—will sooner or later die, even though, so far as can be recognised, their surroundings and conditions of existence remain the same as when their vitality was at its prime. On the other hand, those organisms which reproduce by a process of fission cannot, with a possible partial exception to be presently noted, be said to die, but to continue their existence in their progeny, which primarily consists of the constituent material of their parents, the whole of the parent body being used up in the formation of the descendants. If we regard, as I think we are entitled to do, fissuring of a protoplasmic unit (cell) as the exhibition of an extreme and peculiar form of

the power of contractility, which is possessed in some degree by all matter that is living (induced by some stimulus, the nature of which is quite unknown), but only manifested on certain occasions, then we bring the reproductive act of these asexual organisms into line with the common properties of living matter, and facilitate its consideration and description. If each resulting portion of a fissured cell continues to exhibit, after its separate existence, the characteristics of all living material as possessed by its parent, its power of self-nutrition with all therein implied, and its powers of adaptability, within limits, to varying conditions, and in due time to subdivide into two portions, each again continuing the *rôle*, then, indeed, such beings cannot be said to die, except by accident, and are essentially immortal. No greater difference in identity exists between parent cell and progeny than exists in the parent cell itself at successive periods of its own existence, consisting, as that existence does, of ceaseless changing with continuity of character. All unicellular organisms, however, do not appear to be capable of unlimited propagation by fission. It has been long known that the infusoria, which are among the highest developed of the protozoa, do, after a series of such multiplications, gradually exhibit a slackness in their fissuring, until at length the act is no longer repeated, and the individual dies. But should the infusorian meet with another of its kind in a like state of enfeeblement, and a temporary conjugation between the two occur, they will then separate, reinvigorated with a new lease of vitality, and continue their propagation by fission until again exhausted. Such a condition is one of less complete immortality than obtains in other protozoa and protophyta, but it falls considerably short of the inherent mortality that pertains to all forms of multicellular life. Among the metazoa and metaphyta by no means can senescence and death be averted, however favourable may be the conditions for their continued existence. But even then some multicellular organisms do not wholly die. The body of the individual undoubtedly perishes, but the sexual elements contained therein, and for the production and care of which the individual soma finds its chief *raison d'être*, whereby the species may be maintained, continue to live, given only suitable conditions, and the fertilised ovum resulting from these elements, consisting as it does of integral parts of the parents, develops and grows, thus main-

taining generation to generation in structural continuity. Death, therefore, which is a condition only known in the higher divisions of living beings, comes to mean a cessation of some only of the activities possessed by these beings—the greater proportion of their activities it must be admitted, and those which concern the maintenance and well-being of the individual as opposed to those by which the race is continued. It is the mass of the body that dies, that which lives or can live, conditions being favourable, constituting but a minute fragment compared thereto, in the highest forms of all a mere particle, and this participates in its partner's death unless removed to suitable surroundings. I need scarcely say that I make no reference to organisms being killed, that is to say, being subjected to unfavourable conditions of the environment. Countless myriads of immortal protozoa die, but that is due to the nature of their surroundings; they do not contain within themselves the inevitable destiny of death which they cannot avoid. Similarly, myriads of the equally immortal sperm and germ elements of the higher and highest developed forms perish from like causes. My remarks obviously apply to death as a natural phenomenon, and as such it has a somewhat more restricted scope than at first appears.

The relationship of the sexual element to the enveloping and protecting soma is worth a moment's thought. Possessing as it does when suitably blended a potentiality of growth and development to the parent form, and dependent on the soma for such nourishment as it may require, it nevertheless maintains a passive existence in the midst of its surroundings, waiting, so to speak, its chances, which accident may prevent from ever coming to it. Meanwhile, the body continues to exhibit the functional activities of its vitality, however simple, however complex, until these processes of themselves gradually fail and finally cease. We are accustomed to recognise in the course of existence of a living being three stages: one of growth and development, one of maintained maturity, and a third of decline and senility terminating in death. For the most part, if not absolutely, these stages are characterised by very considerable differences, both in respect to the origin of life and to the cessation of it. During the first period the multiplication of the tissue elements and their individual increase in size, and more remarkably their differentiation of structure and specialisation of function, are all at the maximum,

fresh living tissue elements are formed by the division of pre-existing ones, and the generation and development of material prevail everywhere, notably, however, in one situation in a laggard fashion and sometimes scarcely at all, viz., among the portions which will ultimately give rise to the reproductive elements. Their inactivity is in marked contrast to the often rapid development of surrounding structures, they multiply but little, and differentiate scarcely at all, retaining throughout this period an embryonic character, such as they have possessed since they underwent the first stages that followed their separation from their parents. At this stage, when all efforts are put forth on behalf of the individual, its reproductive power is but slight or entirely wanting, and in the natural sequence of events, and accidents apart, death is unknown. When, however, full development is attained and the individual is complete, then a difference in the relative properties of these phases is seen. The efforts of the soma are directed to the maintenance of its structural integrity. The fully differentiated tissues exhibit their own functions and harmoniously work to the same end, viz., the life of the individual. Now the reproductive elements are mature, and the individual is capable of taking part in reproducing its kind. In a vast number of living beings the sexual elements are produced in the same individual, when self-fertilisation may or may not occur: in the highest forms they are borne in different bodies; but, be that as it may, the stage of maturity is that in which the sexual power of the individual is at its maximum, the formative functions of the tissue have largely diminished or even ceased, and death again except from mischance does not occur. Finally, after this stage has lasted a certain time more or less peculiar to each species, and not, perhaps, wholly unconnected as regards duration with the length of the preceding period, the organism begins to fail in its activities, to live less perfectly, and, as we say, to grow old, the tissue elements are no longer or but imperfectly renewed, those that remain atrophy and degenerate, the power of reproduction has departed, the individual has fulfilled its destiny, it has lived and reproduced, it now remains but to die. But death now is not an accident, it is an inevitable, inexorable event. Such a course is altogether in harmony with the principles which we recognise as natural selection and the survival of the fittest. The being that has filled its mission only

cumbers the ground, consumes nourishment required for those still in the fulness of their powers, and occupies valuable space; death for such is the fittest that can happen.

In this sketch of the successive periods of existence, and for the moment confining our attention to human existence, there may be noted with advantage the relation they bear to the incidence of disease. Disease, which is but a departure from normal living, such departure being detrimental or even fatal to the well-being of the individual, associated with some changes from the normal structure, ill defined in its limits because normal structure and function are ill defined and not accurately known, induced by some unsuitability in the conditions of the environment or imperfection in the original germ plasm whence the individual developed—disease, I say, has, like death, no natural connection with the stages of growth and maturity. All maladies occurring at this time are non-natural and are, or should be, preventable, and, apart from hereditary or congenital affections, the causes of which should have been averted in the parents or should have been prevented from perpetuation, are wholly due to external influences. On the other hand, during the decline of life disease as signifying a functional shortcoming from the normal standard of the prime is a natural incident. We may be able to show that a healthy old age is free from many of the ills commonly ascribed to it, and even that some not inconsiderable reparative power may be retained by the tissues; but nevertheless it is in the natural course of things for the tissues generally, some more than others, to degenerate, to become, that is to say, less complex in chemical composition and therefore more fixed and less capable functionally. One may be surprised now and then with exceptional cases in which the nervous or even the muscular energies have been unusually prolonged, just as the procreative power is occasionally sustained until an advanced age, but however long beyond the usual they may survive there is a limit to their manifestations. Did time allow it would be interesting to compare the clinical features of the diseases as they occur at these age periods, but I content myself with pointing out the normal incidence of disease, which in all cases approximates towards dissolution, as occurring simultaneously with the natural tendency to death.

If now we pass from the soma as a whole to consider the various constituent tissues as they exist in the highest forms of

life we are struck by several notable circumstances. Among the varied component parts of the mature soma, all derived from the fertilised ovum and in their earliest beginnings identical in appearance, the widest range of ultimate differentiation is attained. Whilst some, such as nerve cells and muscle fibres, represent the maximum of departure from the primary embryonic elements and with that the highest specialisation of function, others, like the white blood corpuscles and the simpler cell elements of the connective tissues or of the deeper layers of some epithelial surfaces, are but slightly removed in appearance from their embryonic ancestors, have differentiated but little, and are possessed of far inferior range of vital capability. But a further and striking contrast exists between these two groups—viz., in respect to their ability to reproduce their kind. A fully developed nerve cell or muscle fibre is not known to divide and multiply either in health or under the conditions of disease, but when once its full structure is attained by a process of continued fission and progressive differentiation the tissue element undergoes only such changes as are involved in its nutritive activity until overtaken by disease and death. Not so the simpler forms; they are constantly multiplying, much indeed as free unicellular organisms, and for the most part their successive progenies resemble almost or quite exactly the parents. With this one cannot but remember that the simpler tissue elements here mentioned appear to be equally and perhaps mutually active in effecting those reparative changes which are necessitated by accident or disease, reverting in so doing nearer and nearer to the embryonic form, and so giving rise to the healing tissue. Here, then, from this point of view, it will be seen that the highly differentiated tissue elements, like the more complex individual, invariably die, whilst the simpler forms, in proportion as they approximate to the germinal elements and as such to unicellular organisms, retain the power of multiplication and so escape from death the longest, though they have not the potentiality of development into an entire individual such as is possessed by the germ.

From the foregoing considerations we are now in the position to make these general statements:—1. That death as an incident in the evolutionary cycle is not inevitable to all living beings. 2. That whilst unicellular organisms are immortal, those of any higher grade of structure of inherent necessity die. 3. That

these latter are, given favourable conditions, continuously propagated by specialised portions of their own substance, the individual itself, apart from these portions, perishing. 4. That the power of self-division and hence of perpetuation with avoidance of death, is lost by cells which have advanced beyond the most rudimentary stage of differentiation, such power being restricted to those elements which retain their embryonic character, and most completely by those which form the sexual elements.

From such conclusions, then, naturally follows the question which is at the root of the subject, How is it that the vital processes decline and cease after a manifestation over a tolerably definite period more or less peculiar to each species of animal and plant, peculiar to them in the same sense as a specific size or shape is peculiar? What is the immediate antecedent to the cessation of vital activity as invariably seen in sexually propagating organisms? Whence comes, and what is the nature of the breaking strain which disrupts the ceaseless interchanges which constitute life? It may be at once admitted that no satisfactory answer can be given, and any attempt thereat, however reasonable, only pushes the question a step further back; but even that, if sure and certain, is a gain—it would be one more stage in the ascertainment of the sequence of phenomena which is the function of science, though leaving the "first cause" still unknown as being beyond the range of our perceptive faculty. To begin with, it has been shown that all protoplasm, all living matter, is not of necessity mortal. It is only certain specialised forms of protoplasm that are so distinguished, only certain individual living beings which inevitably die. If these two groups of individuals be contrasted, some clearer definition of the problem may be forthcoming. In the one case the individuals consist of but single isolated and independent particles of living matter (cytoplasm and nucleus), each possessing and manifesting all the phenomena which make up life; each particle is irritable, responsive to a stimulus, and exhibiting contractility (usually so disposed as to effect its locomotion) and some solvent (secretory) action on the foreign matter which constitute its necessary food and in virtue of which its nutrition is maintained. Each particle is endowed with a certain degree of the power of adaptation to its surroundings, which in turn exerts a modifying influence upon it; and, lastly, it can and does possess the capability of self-division,

splitting its entire self into two similar parts which differ from the parent individual only in bulk—a difference that is rapidly lost by simple growth from suitable ingesta.* Such individual beings, then, are all capable, all living, each one is complete in its vitality, and never, except by accident, dies.

The individual of the other group consists not of one but of many cells aggregated into colonies and masses of countless sizes and shapes; such cells, incapable for the most part of independent existence and mutually dependent for their well-being, collectively constitute the living individual. The organism thus constructed, so far as living goes, does no more than the simpler unicellular being, but it lives more perfectly, more elaborately, its vital processes of movement, of nervous manifestation, of secretion—in short, of its entire nutrition—are developed and exhibited at a higher pitch of perfection; its range of adaptability to the environment, of resistance or yielding to surrounding influences, may be greater, but in the long run it attains no further object than that accomplished by its simpler neighbour, viz., the propagation of its species, whilst the price it pays for its greater elaborateness of living is its inevitable death. Thus stated it would seem that the differences between these groups are of degree rather than of kind. The more complex vitality of the one is associated with a greater complexity and differentiation of structure, a subdivision of labour, that is, special functions being associated for their more perfect performance with more highly specialised structures, though these same structures, in proportion as they are differentiated, lose the power of self-division which is possessed in common with the other vital powers by the simplest form of protoplasm. These are but grades, and all intervening degrees are to be found between the highest and lowest beings. Nor is the difference as regards the incidence of death fundamental; whilst the one individual lives wholly in his immediate descendants, the other lives but in part, his own identity being lost in his death. But however much this mode of stating the case may conduce to a clearer understanding of the problem at

* It cannot reasonably be argued that this division into two is a virtual death of the parent individual in anything like the same sense as we speak of the death of a higher animal or plant, or that the progeny of the latter perpetuate their parents in the same sense that the resulting halves of a fissured cell do so.

issue, there still remains the unsatisfied question, How is it (or in common phrase, what is the cause of?) the organism, once that it has reached its maturity, in the full plentitude of its powers both for its own existence and for its own perpetuation, gradually comes to fail, grow old, and die? Why should it not, when once fully established, so continue for all time and remain immortal itself as well as perpetuated in its descendants? Wherein is the explanation to be sought? Is it in the continued effect of surrounding circumstances and conditions, the adverse influence of which gradually prevails, or is it from some inherent defect in the vital processes which becomes intensified by time and constant repetition? In whatever direction the source and nature of the disturbing influence are to be looked for, it would assuredly seem to be in that same region where are to be found the conditions which determine the chemical and molecular changes that constitute nutrition and vitality itself; and inasmuch as cell division, which is the essential of propagation, is but a phase of that aspect of nutrition known as contractility, it would appear that what knowledge we may come to acquire of the intimate nature of life will equally provide us with the explanation of the conditions of its origin and of its termination, inextricably linked as these phenomena are. Conceiving as we do that the energies of vitality are the sensible expression of continuous interchange in a highly complicated material, one phase of which is a building up, or assimilation, to be succeeded at some higher degree of complexity and instability by a breaking down and dissimilation, is it in the anabolic stages that the inherent antecedent that finally arrests the metabolism, and with it life, is to be found? or is it that in the catabolic descent, materials may be formed which exert a slowly increasing pernicious influence on the entire process, autogenitic poisons, in fact, that are invariable accompaniments of protoplasmic change? Or, lastly, may it be some failure in the stimulus, the existence of which is involved in our conception of this same protoplasmic activity? Conformably with our fundamental hypothesis of the nature of nutrition, it is difficult to see any other direction in which to look for our desired antecedent. Expressed in terms more in accordance with our grosser conceptions of physiology, does death result from some imperfection in the nutritive material (ingesta), or in some toxic product of waste (egesta), or for want

of the needful stimulus to the very changes which involve the material and determine the products? That it is the soma that dies, and that the life of the soma or individual is identical with its nutrition would, consistently with our present hypothesis, make it probable that somewhere within these concepts what we are seeking is to be found.

As may be supposed, many suggestions have been offered which find their place in one or other of these categories. Some, with Mr. Herbert Spencer, have sought to explain the phenomena by assuming a failure in the nutritive supply or in the ability to appropriate the ingesta on the part of the organism, the same conditions, in fact, as those which determine the limits of size peculiar to each living being. However true this may be, it gives no explanation for the inability displayed by the tissues. Among the theories which are based upon the determining cause of death being produced in the course of the changes which constitute life, may be mentioned that of Lendl. According to him the protoplasm in the course of its living forms waste products from which the germ plasm at first starting is free; as the cell divides these materials—termed by him "ballast"—are restricted to one of the resulting pair, and in the course of the subsequent growth and development of the organism those morphological units which form the perishable soma are loaded with ballast, whilst those which are destined to the perpetuation of the species, whether they be limited to the sexual elements, as is usually the case, or form a part of the general structure, as seen in some leaves—*e.g.*, begonia—are free from the noxious material and in consequence escape death. It need scarcely be said that no proof of this hypothesis exists any more than there does of the suggestion that it is the presence of an aldehyde in living protoplasms, which serves as the stimulus to its activities and that death is caused by a want of this substance. Others have assumed that the stimulus to vitality emanates from the nucleus which in the process of living becomes gradually exhausted and is finally extinguished.* There is one circumstance which seems to bear a very constant relation to the onset of death—viz., the reproductive effort. In very many beings this effort is made but once, and

* For the discussion of various theories on the intimate nature of death, *see* 'La Structure du Protoplasme et les Théories sur l'Hérédité par Professor Delage,' 1895.

then as a rule death soon follows. In others the effort is capable of being repeated over a period (maturity) of varying length, but when it fails senescence sets in. A review of all the circumstances would seem to show that failing vitality follows the cessation of reproductive capability rather than that this latter fails because of approaching death, and, if we may speculate with others, it appears to be among the possibilities that the lacking stimulus is to be found in connection with the sexual elements themselves—some ferment, may be, such as we assume to exist in those lately recognised internal secretions the potency and influence of which in respect to nutritive processes we are but just gaining a glimpse of. An analogue for my suggestion is perhaps to be found in the case of the thyroid and thymus glands which exercise a profound control over tissue nutrition and even over growth itself. So may it be with the reproductive organs and their products. Exhausted by their efforts to perpetuate the individual, they no longer liberate that stimulus (call it provisionally ferment, internal secretion, or what you will till more precise knowledge defines it) which is needful for the maintenance of the nutritive processes of maturity, and for lack of which the individual deteriorates and dies. May it be that there is a real truth embodied in the experiments of Brown-Séquard, however incomplete they have hitherto been in results?

Based on some such considerations as these I have put forward must be, I take it, the full comprehension of the nature of death as we are in the habit of witnessing it at the bedside. We speak of cardiac failure, of fatal intoxication, whether from within or without, of arrested nerve influence and the like, but the real meaning of such phrases, imperfect as they are and often quite inadequate to explain why death should have happened, must be somewhere in the region I have now been groping in. Moreover, the very foundations of prognosis, if not of treatment, so far as this may attempt to modify nutritive processes by drugs or other reagents, must be built upon an understanding of the intimate nature of life and the inherent causes of its failure and cessation.

CLINICAL EVENINGS.

November 11th, 1895.

CASE OF MELASMA TREATED BY SUPRARENAL GLAND EXTRACT.

By A. Ernest Sansom, M.D., F.R.C.P.

G. W., aged 25, farm labourer, was admitted July 25th, 1895, into the London Hospital, complaining of great weakness, constant frontal headache, noises in the ears, and occasional nausea and vomiting.

His family history was unimportant; no history of phthisis could be obtained.

Present Illness.—He stated that until 12 months ago he had always been quite healthy; he had been employed as a farm labourer for the last three years. About a year ago he said he first "began to feel a bit queer," and found he could not walk far without getting tired. Seven months ago he first noticed some brownish coloration of the skin of the face.

Condition on Admission.—Fairly nourished, hardly looks his age, face round; he has rather a boyish appearance. Anæmic, apathetic, lying in bed for the most part with closed eyes, taking very little notice of those around him. Complains of a good deal of nausea, but no actual vomiting.

Over the face are several areas of pigmentation, light bronze in colour, irregular, varying in size up to two square inches; these patches are not well defined. Scattered irregularly over them and the whole face are numerous spots of dark sepia-coloured pigmentation, varying in size up to $\frac{1}{6}$ inch in diameter. These smaller patches much resemble freckles. Note that the patient has been indoors now for some months. There is a dark line on the lips where they come in contact. No patches on mucous membranes, mouth, or tongue. Over inner surface of both knees are patches of bronzy pigmentation, well defined, reticulated

in arrangement. Both forearms show numerous dark sepia spots up to $\frac{1}{4}$ inch diameter. Nipples manifest a little abnormal pigmentation.

Skin quite smooth and soft everywhere, even over pigmented areas; no itching, no enlarged glands. Digestive system normal, except for some constipation. Spleen not felt to be enlarged.

Pulse 84, fair volume, tension low. Sphygmograph indicates sudden contraction of the ventricle with considerable dicrotism, volume considerable. Heart normal, slight systolic murmur in the second interspace.

Patient has night sweats, and complains of giddiness and dyspnœa on any exertion.

No physical signs in lungs.

Complains of "pins and needles" feeling in legs at times. Sensation normal. Knee-jerks and plantar reflexes easily obtained. Optic discs, &c., normal. Urine acid, amber, S.G. 1033, no sugar, faint trace of albumen.

Blood examined showed some deficiency of red corpuscles (75 per cent. of the normal), white corpuscles about normal; no marked alterations in shape, &c. Temperature 100° F. on admission, usually normal, occasionally rose to 99·5° F., never higher.

Treatment and Progress.—On admission patient weighed 8st. 6lb. He was passing about 50 oz. of urine daily. He was given a mixture containing citrate of iron and strychnine, and afterwards small doses of arsenic. After two weeks of this treatment he had lost $1\frac{1}{2}$ lb. in weight; his headache was constant and, if anything, worse.

At the beginning of August treatment by tabloids of suprarenal gland was begun, antipyrin, phenacetin, canabis indica, all having failed to relieve the constant headache. After taking the suprarenal tabloids for a month (at first one and then two or three times a day) *he had gained fourteen pounds in weight*, the headache was much better, and he was eating well and was able to take walking exercise in the garden every day.

At the end of September he was sent to the country for three weeks, and the tabloids stopped.

When seen again, October 20, the red corpuscles were normal in number, and hæmoglobin present in about the normal amount. Still headache at times, but patient much stronger, and able to do some light work.

The spleen was just felt below the ribs, and the original patches of pigmentation on face, legs, &c., were certainly much less marked, though still present. Pulse tension markedly improved; no vomiting nor nausea.

Remarks.—I considered this to be a case of Addison's disease, though it had some atypical characters. The usual faintnesses were not present, and the anæmia was more apparent than real; the pulse was not of small volume. The pigmentations were observed over large areas of the skin, and generally closely resembled those of Addison's disease. The backs of the hands, the scrotum, and the axillæ were not specially pigmented, as in typical cases. The dark sepia spots mentioned are often present in Morbus Addisoni. The subjective symptoms were severe and distressing. Preliminary treatment having been ineffectual, I decided to try the administration of the suprarenal gland. The extraordinary improvement and rapid gain of weight suggest the relation of cause and effect. It must not be forgotten that there are sometimes partial recoveries in the natural course of the disease. I hope, however, to watch the case at intervals.

The PRESIDENT asked whether there was any change in the pigmentation. Dr. Sansom replied in the negative. He thought that, though the pigmented spots had not disappeared, they were less pronounced now. In answer to Dr. Ormerod, he added that there was no pigmentation in the mouth, in fact, the case was atypical in several respects. The spots were confined to the legs, dorsum, arms, and hands.

Dr. ALTHAUS asked whether at any time there was sugar in the urine. He referred to a case recently under his observation of "bronzed diabetes," in which there was extraordinary pigmentation of the skin, such as is usually met with in Addison's disease, associated with a considerable amount of sugar in the urine. He gave suprarenal capsules and, for a few weeks, the patient improved very much; but, ultimately, the case had a fatal termination.

Dr. SANSOM said there had at no time been any sugar. The S.G. varied from 1010 to 1020. There had been a slight trace of albumen.

Dr. SAVILL pointed out that the distribution of the patches of pigmentation did not suggest Addison's disease, and in the absence of progressive asthenia and other characteristic signs he hardly thought the case came within that category. The patches on the legs he thought resembled the mottling sometimes seen in people who roasted the legs before the fire.

Dr. SANSOM said that the patient had had no opportunity of sitting before a fire.

TEMPORARY RESECTION OF THE UPPER JAW FOR NASO-PHARYNGEAL GROWTH.

By Stanley Boyd, F.R.C.S.

F. W., aged 49.

History.—Patient has been unable to breathe through right nostril for 7 years, and has had frequent epistaxis. The bleeding got much worse two years ago, necessitating plugging of the nostrils on several occasions. The last three months there has been no hæmorrhage, only blood-stained, watery discharge. A year ago, right eye began to protrude, accompanied by occasional sharp, shooting pain in the globe.

Present State.—Is a healthy-looking man, with no visceral disease. Right eye is pushed forward, outwards, and somewhat upwards; the palpebral fissure much widened; diplopia, but vision good. Right side of nose bulged out. He breathes through the open mouth. The right nostril is absolutely blocked by a firmish, pink growth, with a smooth, shining surface, seen and felt about three-quarters of an inch from anterior naris. A probe passes freely round this in all directions except towards outer wall. Left nostril can be used. He is seldom free from a "cold in the head." Smell slight on left, absent on right side. Right cheek slightly fuller than left. No evidence of elevation of the floor of the orbit. Line of teeth normal. Hard and soft palate normal. Naso-pharynx blocked by mass situate more on right than on left side: smooth, fairly firm, bleeding easily. No fulness behind ramus or angle of jaw externally. No enlargement of lymphatic glands.

Diagnosis.—Naso-pharyngeal growth, springing from base of skull or front of spine rather to the right of mid-line, growing into the right nasal cavity, causing absorption of the inner wall of the right orbit, and pushing the orbital contents before it. Probably of simple nature on account of long history, and smooth, not ulcerated, light-coloured surface.

Treatment.—Neither the palatine nor nasal route seemed to promise sufficiently free access for dealing with so large a growth. Mr. Boyd therefore chose the maxillary, and, though fearing he would have to remove the right superior maxilla, determined first to attempt temporary resection of the bone.

Details of the Operation.—The patient was placed in the dorsal position. The right common carotid was exposed for finger pressure. The usual incision for removal of maxilla was made. The mesial half of the edges were freed, and the bleeding checked. The outer half of this incision was carried back to the level of the temporo-maxillary joint. The nose was separated from maxilla; the orbital contents turned up; the nasal process drilled and divided with saw and forceps; and the temporal fascia separated from the malar and zygoma. The outer end of the sphenomaxillary fissure was found with a probe, and a saw-cut was made into it through the frontal process of the malar; the zygoma drilled and divided. An incisor tooth was now drawn, and a saw-cut was carried through the hard palate and its coverings to the right of the mid-line. The soft palate was left as part of the hinge upon which the jaw was to swing out. The maxilla was dislocated outwards, the pterygoid process easily cracking under finger pressure. A polypoid mass of growth in the nasal cavity was cut off with scissors from the base, which seemed to occupy the body of sphenoid. Pressure atrophy of the upper and posterior part of mesethmoid had occurred, and nothing but mucosa remained. The vomer was deflected to left, but the triangular cartilage was not displaced. The basal portion of the growth was cleaned out of the body of the sphenoid with a sharp spoon; the dura mater was exposed over an area at least an inch across. Bleeding was slight—compression of the carotid unnecessary. The cavity in sphenoid was plugged with iodoform gauze. The frontal process of the malar and zygomatic arch were wired. A small bradawl was bored through the superior maxillæ below anterior nares, nipped through close to bone, and left in: it prevented dropping absolutely, and a loop of wire round the incisor teeth prevented separation. The skin wounds were brought together with horsehair, and also the mucosa of lip. Both skin wounds were collodioned. The operation occupied one and a half hours. The patient became intensely collapsed for two hours. He then rallied, and was much better next morning. Was this collapse due to interference with base of brain? There had been no considerable loss of blood.

On the second day after operation, patient was quite comfortable: no pain. Pulse 108, highest temperature 100·4°. Usual swelling of lid above incision: it has slowly subsided. Plug in nose was

not removed for 10 days; the nasal part smelt horribly, but not the plug in the skull. The nose was washed out after this, and smell disappeared at once; discharge was slight.

On the eleventh day, union of wound was perfect everywhere. All sutures and the bradawl had healed in. The parts have gradually fallen into place; diplopia has gone; health has greatly improved; breathing is free through both nostrils. The nature of growth is doubtful: under the microscope it presents a glandular appearance.

The advantages of this operation are that it gives fair access. The space can be increased vertically and, perhaps, laterally, by incision from before back of the soft palate. Should this not give sufficient room, the maxilla can be easily and rapidly excised, for it has been freed from its bony connections, and without much bleeding. The deformity due to scarring is slight. The chief ill result is from often long persistent swelling of lower lid from paralysis of lower half of orbicularis palpebrarum, and from epiphora from destruction of lachrymal duct. I think that the first two troubles might be avoided by carrying the incision from nose through lower lid, external to canaliculus; by cutting then through the conjunctiva to the outer canthus, and from that point sloping the incision down and out parallel to and between the temporal and malar branches of the facial. The supply of the lower orbicularis might thus be preserved. Sufficient preservation of the lachrymal apparatus might perhaps be effected by cutting the jaw lower and farther out than usual.

Mr. Mansell Moulin said he had recently performed a somewhat similar operation. The skin flaps were the same, but in addition he had made an incision in the mouth inside the alveolar border of the teeth and detached the mucous membrane of the hard palate until he had reached the posterior border. Then he separated the soft palate from the hard. After that he divided the bone; but in his case, as there was no protrusion of the eyeball, he did not interfere with the orbital plate of the superior maxilla, but divided the external angle of the frontal bone. This gave him plenty of room. The growth sprang from the internal pterygoid plate, and did not appear to involve the sphenoidal sinus, and its situation was, therefore, not nearly so serious as the author's case. After removing the growth there was no difficulty in replacing the maxilla. He kept the muco-periosteal flap in position by the pressure of a sponge placed on the tongue. This patient had been exhibited at the Clinical Society two years ago, and the scars were scarcely perceptible. The growth proved to be a myeloid sarcoma which had recurred three times before, but since the operation there had not been any recurrence. He had

looked up the literature of the subject before operating, and he found that there were no less than 13 different methods of dividing or resecting the bone. The author's case differed from his own in that the orbital plate was removed, in other respects the incisions seemed to be the same. He did not put any temporary ligature or pressure on the carotid, and he did not have any trouble with hæmorrhage. He had, however, done a preliminary tracheotomy, which afterwards proved of considerable advantage, on account of the tendency to drop of the muco-periosteal flap. This enabled him to keep it in place by the aid of a sponge placed in the mouth. He recalled a similar operation performed by Mr. Macready, in which he had modified the operation in respect of the muco-periosteal flap. Instead of following the alveolar border he had kept near the margin of the hard palate, thus avoiding such a big flap and preventing "sagging."

Mr. Walsham spoke in favour of splitting the soft palate and cutting away as much as might be necessary of the hard palate. He had had to deal with growths of this kind on several occasions, and he had contemplated doing Mr. Boyd's operation, but so far he had always succeeded in obtaining adequate exposure by splitting the palate. He pointed out that these growths, though they may extend into the nose, and even cause the eyeball to protrude, did not usually involve the turbinal and superior maxillary bones. There was, consequently, as a rule, no necessity for turning the maxilla outwards to get a good exposure, such exposure being obtainable by splitting the soft, and cutting away the hard, palate. There were several objections to the operations performed by the author. First, there was always some scarring, although, as in Mr. Boyd's case, it might be very slight, whereas with the palatal operation there was absolutely none. Then, again, it was not uncommon, after removal of the maxillary bone, to have a good deal of trouble with the lachrymal duct; and, in several cases, he had seen much œdema and swelling of the lower eyelid which had not always disappeared as completely as it had done in the author's case. Then, too, the reflecture of the maxilla was attended by great collapse, sometimes with severe hæmorrhage; but nothing of the sort was to be apprehended with the procedure which he advocated. In view of the alarming hæmorrhage that often attended the actual removal of the growth, it was important that there should be as little preliminary hæmorrhage as possible during its exposure. He suggested that if the author had not yet tried this method he should do so, in order to be able to compare the two.

Mr. Wallis remarked on the wonderful change in the man's appearance since the operation. He himself had intended to speak on the lines that had been taken by Mr. Walsham, and he referred to a case of his own of a large naso-pharyngeal growth. When the patient came to him for the fourth time he had thought very seriously of performing an operation similar to that described by the author. The growth protruded through the nostril, and the patient had lost a good deal of blood. Mr. Wallis determined, however, in the first instance, to try to obtain access by the method described by Mr. Walsham, feeling that if he failed to get sufficient exposure he would not be so very much out of the way of removal of the superior maxilla. After a preliminary tracheotomy he split the soft and the hard palate, stripped the muco-periosteum back, and then with a chisel and mallet he went through the hard palate. What interested himself and others was the excellent exposure which this proceeding afforded. The whole of the growth was perfectly acces-

sible, and it proved to be attached to the internal pterygoid plate. It was torn off with a very small amount of hæmorrhage, and the palate was united. He regretted to say that the sequel was not so fortunate. The lad had lost a good deal of blood before the operation, and though he did not lose much during the operation he died three hours later.

Mr. Stanley Boyd, in reply, said he did not deal with the soft palate at all, but left it as part of the hinge.

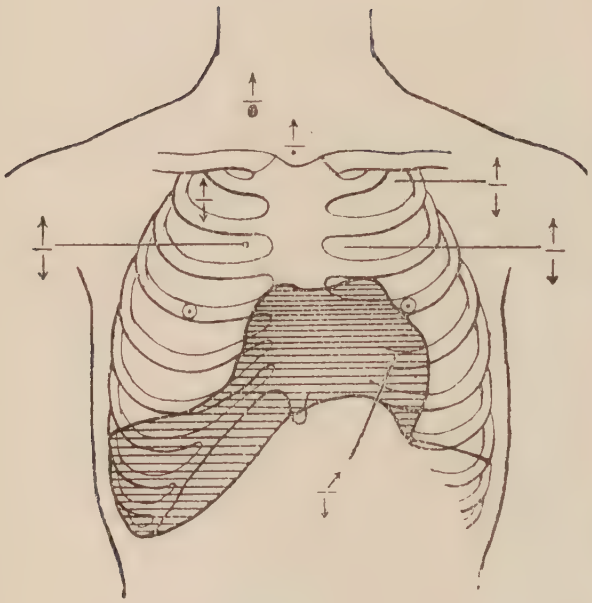
CASE OF CONGENITAL IMBECILITY ASSOCIATED WITH CONGENITAL DEFICIENCY OF THE CHEST-WALL, AND WITH CARDIAC DISEASE.

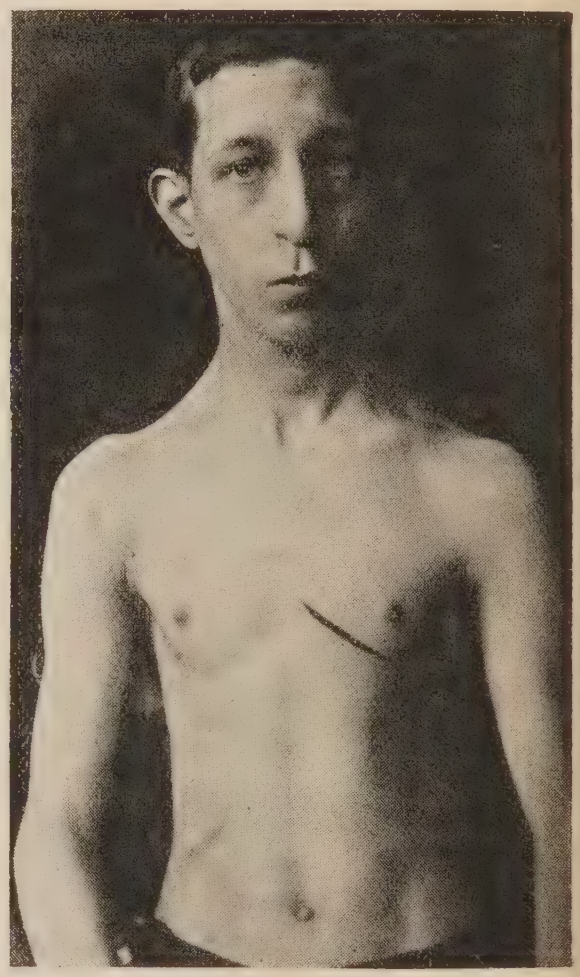
By John Harold, M.R.C.S. Eng., L.R.C.P. Lond.

The patient, a thin, anæmic, and feeble-minded lad aged 16, was one of a family of four. At three years he had scarlet fever, and at

12 had an attack of rheumatic fever from which he had barely convalesced before a second attack supervened, more severe than

the first, and complicated this time with acute pericarditis. He was five years of age before he attempted to walk, and six before he began to speak at all. He was 10 before he could speak distinctly enough to be understood by strangers. The patient's physiognomy was striking (*see* illustrations). His head was doliocephalic in type, the ears stood out, the hard palate was arched and vaulted. There was no facial asymmetry. The nose was large. There was

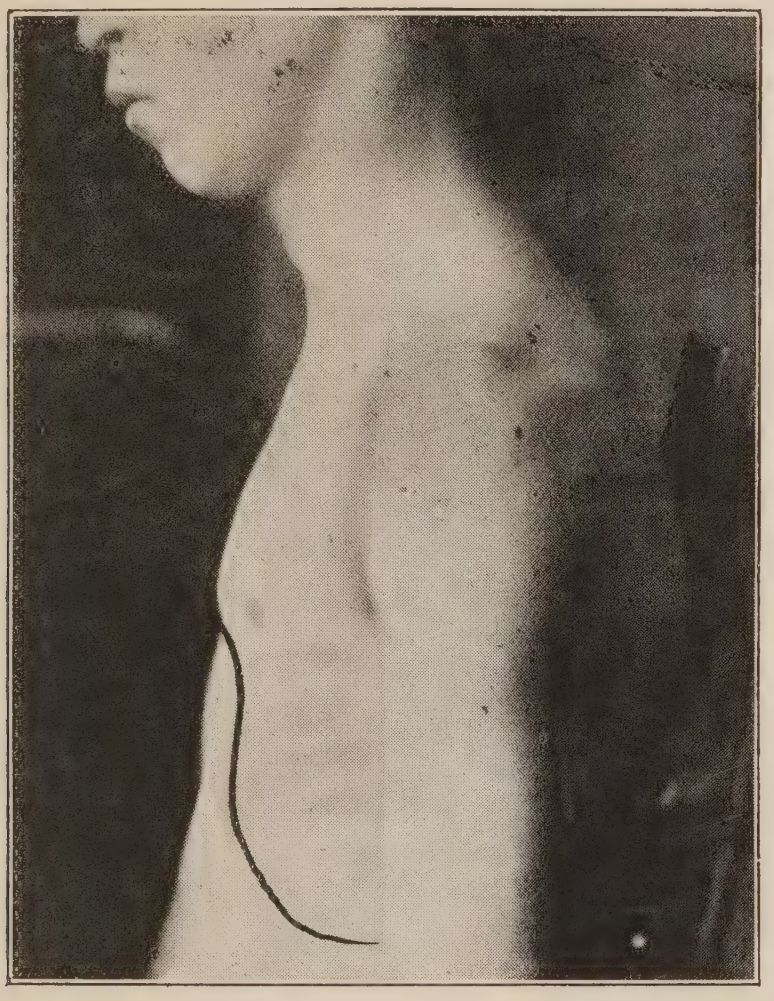




no deformity of hands or feet, of scapulæ or spinal column; no clubbing of fingers or toes, no cyanosis. On the left side of the chest-wall the ribs and rib cartilages were complete down to the fifth. Below that level the rib cartilages were wanting, and the pericardium was thus unprotected, and through the skin the heart could be seen beating with a curious heaving impulse. On auscultation a double murmur could be heard at the base, both systolic and diastolic, and a murmur could be heard where the apex ought to be (*see* chart of chest-wall). It was recently ascertained that the

mother of the patient was actually suffering from acute melancholia, and the other members of the family were strikingly neurotic.

Dr. Fletcher Beach said he had seen the patient two years ago, in consultation with the late Dr. Hack Tuke. It appeared that the mother had suffered a very severe shock during the early period of pregnancy, though it was, of course, impossible to say that that had anything to do with the congenital condition ; indeed, it was very difficult to say how this condition could be brought about. The patient was certainly a very good example of congenital imbecility. He had been at several schools, and could read and write a little, but was weak in arithmetic.



The President observed that usually one found the skeletal defects more marked than the mere mental enfeeblement.

Dr. Shuttleworth said that as far as congenital heart disease was concerned, it was not uncommon among idiots and imbeciles. At any rate, he remembered amongst patients at the Royal Albert Asylum, several well-marked cases with loud præcardial bruit ; the difficulty was to locate the lesion even after slowing the action of the heart with digitalis. In these cases, he thought that most frequently the condition found *post mortem* was pulmonary stenosis ; sometimes there was also patency of the ductus arteriosus, or foramen ovale, or intra-ventricular communication. It was a rare experience to meet with arrested develop-

ment of ribs, as in this case, but defects of the heart, cyanosis, &c., were often associated with mental feebleness.

Dr. Sansom said the case was one of very great interest, the most striking feature about it being the disproportion of the hypertrophy of the right ventricle. The left side did not appear to be anything like so much dilated as the right. After the attacks of rheumatic fever, there was probably mitral regurgitation, but, he thought, very probably there was an aperture in the intra-ventricular septum. He admitted that the physical signs of this condition were not conspicuous, but he had been unable to detect any sign indicative of stenosis of the pulmonary artery. There was some slight cyanosis, but no clubbing of the finger, and the cyanosis was not more than one would get in mitral disease. There was a distinct thrill in the fourth interspace between the nipple and the sternum. He thought there was a congenital abnormality of the heart, probably in the direction of imperfection of the ventricular septum in addition to rheumatic mitral disease, possibly also involving the aortic valves.

Mr. Harold briefly replied.

TWO CASES.

By Frederick C. Wallis, F.R.C.S.

(1) Case of Wired Patella for Fracture.

Mr. Wallis showed a man, aged 70, who had fractured his patella. Being afraid of the consequences of keeping him in bed for a long period he decided to suture the fragments. He made a long incision and came down upon a transverse comminuted fracture, the lower part being split into three pieces. A small portion on the outer side was completely separated from its periosteum, so he removed it entirely. The other two he wired to the upper fragment, being careful not to go through the cartilage lining the joint surface of the one. He referred to the fact that the aponeurosis was torn and stretched, and sank into the space between the fragments, so that no amount of arrangement of pillows and splints could have brought the fractured surfaces into apposition. The patient had no pyrexia after the operation, and on the third day he could sit up. On the eighth day the stitches were removed from the wound, which had quite healed. He was operated on June 26th, and he could now walk without the aid of a stick. Mr. Wallis exhibited a specimen of a wired patella, which had been discovered in the dissecting room of St. Bartholomew's Hospital, showing the excellent bony union that takes place in these cases.

(2) Case of Periostitis of Tibia.

Mr. Wallis also showed a lad, aged 16, who had been treated in the ordinary way by incision for acute periostitis of the tibia. The suppuration had extended into the knee-joint, but although this had continued for six weeks, during which time drainage tubes were left in the joint, he had preserved very good movement of the articulation, and the patient could do a good day's work with it. The tibia was still unhealed, but that was owing to the fact that the patient would not consent to give it the required rest.

TWO CASES.

By Leonard G. Guthrie, M.D.

(1) Case of Spina Bifida Occulta, with Paresis of Leg.

Dr. Leonard Guthrie showed a boy, aged 7 years, who was suffering from spina bifida occulta with paresis of the left leg. At the age of 6 months a tumour had existed on the left side of the sacrum, but this disappeared without treatment. The left buttock was now smaller than the right. The anal cleft was deflected, the convexity of the curve being towards the left. The lamina of the left 1st lumbar vertebra was defective, and over the gap was a congenital cicatrix $\frac{1}{4}$ inch in diameter. There was also a well-marked post-anal dimple on the mid-line at junction of sacrum and coccyx. The left leg had become wasted and the foot deformed during the last nine months.

The wasting was chiefly below the knee, and affected the calf muscles. The instep was raised, the ball of the great toe prominent, and all the toes extended at the first joint and flexed at the distal (paresis of interossei). Sensation to heat, cold, and pain was diminished over the whole course of the sciatic nerve. The posterior tibial nerve showed slight reaction of degeneration. The sphincters' action was normal. The condition of the leg was regarded as due to degenerative neuritis of the posterior tibial nerve, dependent on traction of the spinal cord.

Dr. Savill commented on the condition of the sensations to heat and cold, the absence of which he thought suggested the presence of syringo myelia, which he added was not unfrequently associated with the other condition.

Dr. Guthrie, in reply to the President, said the child's mental condition was satisfactory, and he did well at school.

(2) Case of Postero-Lateral Sclerosis.

Dr. Leonard Guthrie also showed a man, aged 29, suffering from postero-lateral sclerosis. Seven years previously he had had paresis of the left leg and arm, of gradual onset, diplopia, paralysis of the left external rectus, nystagmus, with exaggeration of knee-jerks. The symptoms had entirely disappeared under energetic anti-syphilitic treatment.

A year later he had had spastic paraplegia with exaggerated knee-jerks and ankle clonus, and had again recovered under similar treatment.

Eighteen months ago the weakness of the leg had recurred. He now had a reeling cerebellar gait, with Romberg's symptom, exaggeration of knee-jerks, but no ankle clonus. There was slight nystagmus on extreme deviation of eyes to right, but no other ocular symptoms. His face, arms, speech, and sphincters were unaffected. Sensation was everywhere normal. He had no pains or cerebellar or cerebral symptoms. It was regarded as a case of disease of the postero-lateral columns affecting the mid-dorsal region of the cord. The symptoms from beginning to end were regarded as possibly due to the effects of syphilitic periarteritis recurring in various parts of the nervous system. But the patient strenuously denied ever having had syphilis.

Dr. Routh asked whether there was any history of alcohol.

Dr. Guthrie replied that the patient had never been addicted to alcohol.

Dr. Ormerod did not think the patient was suffering from postero-lateral sclerosis in the usual sense, *i.e.*, as an affection due to primary systematic degeneration of the posterior and lateral columns of the cord. The irregular progress of the case led him to this conclusion. In view of the irregularity of the symptoms, the history of repeated recoveries, the absence of syphilis, and the nystagmus, he suggested that it might be a case of disseminated sclerosis, which he thought would adequately explain the symptoms. He thought that the symptoms pointed to some lesions more extensive, or at any rate more scattered, than had been suggested by the author.

Dr. Guthrie, in reply, said that he had never regarded the case as one of primary sclerosis, and that the symptoms present indicated a limited lesion rather than a multiple. He had used the term sclerosis for want of a better.

CASE AFTER NEPHRECTOMY FOR RENAL INJURY.

By F. Swinford Edwards, F.R.C.S.

J. M., aged 55, was admitted into the West London Hospital on February 23rd of this year, suffering with shock and with free hæmorrhage from a wound in the left loin. Whilst cleaning windows he had fallen from a third storey on to some spiked railings below. The end of the railing was found in his left side, and was extracted by the policeman. The wound was dressed on admission, but this did not stop the bleeding. His face was pale and cold, tongue dry, and the pulse could not be felt. There was a large amount of blood in the urine. When I saw him I had him taken to the operating theatre at once and placed under ether. On enlarging the wound it was found that the eleventh and twelfth ribs were broken in several places, and one or two fragments were removed. There was a deep contused and lacerated wound of the soft parts, which extended to the ant. sup. spine of the ileum. The peritoneum appeared to have escaped. There was free hæmorrhage from the kidney, which lay exposed at the bottom of the wound after removal of the blood clots. On examination the kidney was found to be lacerated both longitudinally and transversely, the latter extending right into the hilum. A stout silk ligature was passed round the vessels and ureter, tied and cut short, with the effect of immediately arresting the free hæmorrhage. The kidney was now removed and the wounds well washed with sublimate solution. A drainage tube and two broad strips of iodoform gauze were inserted prior to partially suturing the wound. On the following day the general condition of the patient was much improved. He had slept fairly well, and his pulse was 80 and good. With the exception of some suppuration, which was only to be expected, and a high temperature at night, *i.e.*, varying between 101 and 103 for some weeks, the patient made an uneventful recovery. On the day after the operation he passed 22 ounces of urine, followed on the second by 32 ounces, third 43 ounces, fourth 45 ounces, and fifth 50 ounces. The urea on the fourth day was estimated and found to be about normal in amount, viz., 473 grains during the 24 hours. No doubt had the peritoneal cavity been involved, matters might have been more serious for him.

TWO CASES.

By T. D. Savill, M.D. (for Mr. Warren Tay).

(1) Double Ptosis and Crossed Diplopia.

W. R., 13, suffering from double ptosis, more marked on the left. Weakness of both internal recti, slightly more on left. Crossed diplopia. No changes of fundi oculorum. Pupils equal and act to light and accommodation. Knee-jerks present; no paralysis of palate. All these symptoms came on suddenly three weeks before without obvious cause; preceded by headache for two or three weeks, and by sore throat for one or two days about same time. No one else in house known to have had bad throat.

(2) Psoriasis Gyrata.

R. S., aged 15. Eruption began on both arms five weeks before, and spread in course of a week. Now symmetrically distributed over arms and legs, and around mouth. The fronts of knees specially involved. Consists of red, circular, scaly patches, healing in centre and spreading at margins. Glands of neck and beneath chin enlarged. No hereditary history. No previous illness. Began to menstruate at 13 or 14. Probably of syphilitic origin.

February 10*th*, 1896.

CASE OF DISLOCATION OF THE HIP INTO THE OBTURATOR FORAMEN TREATED BY EXCISION OF THE HEAD OF THE BONE.

By W. Johnson Smith, F.R.C.S.

The patient, an English seaman, during a storm in the Bay of Biscay on December 4th, 1892, was thrown down and washed along the deck of his vessel by a heavy sea. He was unconscious for a few moments and, on coming to, found that he could not stand on or move his left leg. He was removed to the chart-room and carefully tended during the rest of the voyage, but no attempt

was made by the captain to treat the injured limb. Ten days from the date of the injury the patient was landed at Genoa and taken to a small hospital at that port. Here he remained as an in-patient for four months, during which period he was placed under chloroform, and attempts were made to put the thigh back into its place. The first attempt was made on the third day after admission, and the second a fortnight later. No positive information can be obtained as to the character of these attempts, but according to the statement of the patient the second consisted in forcible manual extension. The patient was allowed to get up about the middle of April, and at the end of that month was sent to England with this notice on his discharge paper: "The re-position has been made under narcotics without lasting effects, the acetabulum being no longer free."

The man was admitted into the Seamen's Hospital, Greenwich, on May 5th, 1893, and then presented all the signs of an unreduced luxation of the head of the femur into the obturator foramen. He was much crippled, and found difficulty in moving about even on crutches. On May 18th, after ether had been administered and a preliminary attempt had been made to reduce the luxation by manipulation, Mr. Johnson Smith removed the head of the femur. The operation was a simple one and consisted in a small skin incision, separation of the adductor muscles, and the application of a chisel to the neck of the bone. The limb could at once be adducted, and during the after-treatment was kept extended by weights. The results of the operation were evident in the patient himself. The limb was fairly straight, there was but slight shortening, there was a good range of extension and flexor movements at the hip, and a fair though much more restricted range of adduction and abduction. These results, however, were much discounted by a very faulty condition of the foot caused by extreme paralysis of its extensor muscle. Mr. Johnson Smith did not notice the distortion until the day after the operation. The patient himself asserted that whilst he was in the Italian hospital the foot hung down, could not be moved at the ankle, and was quite useless. This condition had been treated by galvanism, and also by tenotomy, with no good results, and the patient refused to have the foot removed. Whatever may have been the cause of this condition, it must be regarded as a most unfortunate one, as it

rendered the patient a cripple and interfered with the results of an operation which might otherwise be fairly regarded as very satisfactory.

CASE OF UNREDUCED DISLOCATION OF THE HIP INTO THE OBTURATOR FORAMEN.

By George R. Turner, F.R.C.S.

Admitted to the Seamen's Hospital December 30th, 1895. In September, 1895, about three months before admission, while standing at the side of the ship, he was knocked over by a sea, and apparently tried to catch hold of the bulwarks, but failing in this he fell on to his right side in a half-sitting position with his right leg doubled under him. He was unable to move for three weeks, and the ship did not reach Santos, its destination, till eight weeks after accident. He was taken to the Spanish Hospital at Santos, where several attempts were made at reduction both with and without anæsthetic. He was then shipped for England, and the doctor on board this vessel again attempted reduction with block and tackle under anæsthetic. From patient's account considerable force must have been used, as there was a good deal of extravasation of blood afterwards.

On examination, when lying flat down, the left lower limb is considerably flexed at hip joint, the direction of the long axis of the femur being outwards, the foot, which is on a higher level that the right, is everted and lies some distance outside a line dropped vertically from ant. sup. spine. The head of the femur can apparently be found lying under the scrotum and very nearly in the perineum. The thigh can be flexed quite on to the abdomen, but cannot be extended. Both internal and external rotation are limited to less than half their usual extent. When he attempts to lie on his face he has to lie slightly on his right side, the left leg presenting the appearance of being longer than the right, due to tilting of the pelvis. The buttock is uniformly flattened, the great trochanter being felt about its centre. By tapping sharply on this point, you can get reflex flexion, and sometimes a clonic spasm of the gluteus maximus.

When standing upright, the great toe of the left foot does not quite touch the ground. The direction of femur is downwards,

outwards, and forwards; the left foot is everted and heel drawn up, the great toe being some inches in advance of that of the right leg. There is real shortening of 1 to $1\frac{1}{2}$ inches.

The patient can only limp, and is obliged to hobble about with a stick.

For the above notes Mr. Turner is indebted to Mr. Isaacs, house surgeon at the Seamen's Hospital, Greenwich.

Mr. Noble Smith observed that the result in the first case was excellent. He thought the malposition of the foot due to the paralysis might, to a considerable extent, be remedied by tenotomy; getting the foot into a better position, and using a support to keep it at a right angle with a T strap to counteract the varus position. The patient ought then to be able to walk fairly well, the shortening being not more than half an inch.

Mr. Sheild said the first case illustrated forcibly that no attempt should be made to reduce old dislocations by block and pulley. The result of the operation in Mr. Johnson Smith's case showed what could be obtained from excision of the head of the bone, and this was beyond question the wisest, safest, and most scientific method of dealing with such a case. With regard to the paralysis of the foot, he said he had twice seen it as a complication of dislocation of the hip. The sciatic nerve was not uncommonly injured. With regard to Mr. Turner's case, he observed that in many cases of complicated injuries about joints, the diagnosis was necessarily more or less speculative; and the only accurate way of ascertaining what was the nature of the injury was to cut down upon it and see. In this particular case, however, he inclined to the opinion that there was a fracture as well as a dislocation. He thought so because were the head of the bone situated where it was imagined to be, there would be no shortening of the limb. The shortening pointed probably to there being a fracture as well as a dislocation. Obturator dislocations he pointed out were rare except after considerable violence, as in railway accidents, &c. If treated at once the head of the bone readily returned to its place, but in old standing cases excision of the head of the bone was certainly the right operation to perform.

TWO CASES.

By Edward Cotterell, F.R.C.S.

(1) Case of Laminectomy for Paralysis due to Cervical Caries.

L. H., aged 13 years, was admitted on May 4th, 1895, into the West End Hospital for Nervous Diseases, under the care of Dr. Wallis Ord. Owing to Dr. Ord's absence through illness, Dr. Fletcher Beach took charge of the case, and has given me the following notes:—

Upon admission the patient was found to be a well-grown girl,

fair hair, and widely-dilated pupils. On the right side of the neck there is the mark of an old scar, due to removal of an enlarged gland five years ago, and there are now some enlarged cervical glands to be felt in the neighbourhood of the scar. The head was rigidly fixed, and has been so for 18 months before admission, owing to old caries of the cervical vertebræ. There was no pain on pressing upon the top of the head, nor when the heels were jarred on the floor. Upon examining the pharynx there could be felt a projection forwards—some of the bodies of the cervical vertebræ—behind the soft palate.

There was paralysis of the right arm, which was not quite complete on the ulnar side. This loss of power is said to have come on nine weeks before admission, and was attributed by the parents to a chill contracted during the severe cold of last winter. The right hand was cold and blue. The child was not subject to fits.

On admission, the patient could feed herself with the left hand, but gradually this side became affected, and then power was lost in the right leg and then in the left one, the patient dragging them as she walked.

On June 11th galvanism to the spine was ordered, but as the loss of power became worse this treatment was stopped.

Towards the end of June I saw her, in consultation with Dr. Beach, and we decided to explore the cord in the cervical region. Accordingly, on July 1st I removed the spines and laminæ of the fourth, fifth, and sixth cervical vertebræ. No granulations or carious bone could be detected anterior to the cord. The dura mater was not opened. The wound healed by first intention.

On July 3rd she began to move the left hand.

On July 5th she moved the left hand and arm, and could hold it up.

On July 10th moved right hand slightly.

On July 15th can raise right hand and arm above the head.

On August 5th the patient sat up for an hour. By this time she has regained power in her legs.

On October 25th she was examined and found to have complete power of movement and no loss of sensation. There was no pain or tenderness of the neck, which was stiff, and could only be moved very slightly.

Dr. Outterson Wood confirmed the statements as to the loss of movement and sensation, which had been very marked, though the patient had since been completely restored to health.

Mr. Noble Smith said the case quite bore out what he had previously urged, viz., that laminectomy was seldom, if ever, a justifiable operation in cases of acute caries; but that if, after the subsidence of the acute process, symptoms of nerve disturbance remained or came on, then was the time when laminectomy ought to prove useful. The only case in which he had performed laminectomy was under these circumstances in an adult, in whom difficulty of walking remained long after the cessation of the caries.

(2) Case of Exostosis of the Orbit.

I am indebted to Mr. Arthur White, our house surgeon, for the following notes of this case:—

S. H., aged 18 years, a thin, poorly-developed, anæmic-looking lad, by occupation a bootmaker's assistant, was admitted into the Cancer Hospital, December 6th, 1895, with marked protusion of his right eyeball, and displacement downwards and outwards. He has a strong family history of carcinoma, his mother and mother's brother having both died of "cancer of the face." He has had no previous serious illness, and has always been fairly strong. Two years and a half ago he first noticed a small lump, the size of a pea, at the inner angle of the orbit. It has increased steadily up to the present, but patient himself and his friends both state that during the last six months it has grown much more rapidly. There has never at any time been any pain.

On admission the eyeball was much displaced downwards and outwards, the lower edge of the cornea being about half an inch lower than the other side. The movements of the ball were good in all directions. Pupils dilated, equal, regular. There is diminished acuity of vision; no evidence of loss of function of supra-orbital and supra-trochlear nerves.

Ophthalmoscopic Examination.—The media of the eye are clear. There is no marked blurring of the edges of the disc and congestion, the disc being nearly of the same colour as the rest of the fundus oculi. Veins full, with small arteries. Optic neuritis. There is a very hard, nodulated, firmly fixed swelling at the inner and upper part of the orbit; on deep pressure it is felt extending under the supra-orbital ridge halfway across the orbit. It is uniformly hard all over. No tenderness.

Operation, January 11th, 1896.—Under gas and ether, incision

along supra-orbital ridge through eyebrow. The periosteum was incised and peeled down until the tumour was reached. It was found to occupy nearly the whole of the upper and inner part of the orbit, and firmly fixed by a sort of pedicle joining it to the supra-orbital ridge at its inner extremity. This pedicle was cut through with a chisel and the tumour levered out. The wound healed rapidly and satisfactorily.

At the present time patient has good movement of eyeball. The blurring and congestion of the disc have now practically disappeared, and the displacement of the eyeball is markedly less.

TWO CASES OF SINUS OVER THE SACRUM AND COCCYX.

By D. H. Goodsall, F.R.C.S.

Mr. D. H. Goodsall showed two cases of sinus over the sacro-coccygeal articulation.

Case 1.—T. C., age 23, clerk. The sinus was left by an abscess which broke of itself after it had been gathering for several days; no history of any injury to the part.

Case 2.—M. P., age 24, shoemaker. Eighteen months ago he fell on the pavement, striking the sacrum against the kerb. Two days after the fall a swelling appeared over the sacro-coccygeal articulation; six months later the swelling broke of itself, since it broke, the sinus has discharged continuously.

In both cases the sinus was on the left side of the sacro-coccygeal articulation. The sinuses, together with every branch sinus, were laid open completely, and then scraped, afterwards they were firmly packed with dry cotton wool. The wounds quickly healed, and have remained sound.

In all but one of the 14 cases seen by Mr. Goodsall, the sinus was on the left side of the sacro-coccygeal articulation. In quite two-thirds of the cases there was a clear history of a blow or fall on the part. Some of the cases had been treated as cases of necrosis of the sacrum, bone having been removed without any beneficial effect. They were cured by completely laying open the main sinus, and every branch sinus or pocket leading from it.

Mr. Swinford Edwards said that he could bear out the statements of Mr. Goodsall, for some years ago he had had a similar case to deal

with at the West London Hospital. He treated it as a case of caries of the sacrum and coccyx, because the probe gave a very distinct sensation of bare bone. He did what he thought was a radical operation, but he found it necessary to repeat it before he obtained a cure. He remembered a similar case under a colleague at about the same time, in which an unsatisfactory result followed. The three cases of the kind he had had since he learned the author's views had all proved quite satisfactory, and he was grateful to the author for showing him how, with this limited operation, it was possible to obtain prompt and satisfactory results.

Mr. Herbert Allingham pointed out that irritation by injury of certain congenital cysts in that situation might set up inflammation culminating in these abscesses. In one such case he opened the abscess, and finding it lined by a cystic membrane he removed this in its entirety, with a satisfactory result. He added that one sometimes met with a dimpled and puckered condition of the skin over the coccyx not due to disease, but due to some congenital obliteration, hence the importance of laying them all open.

CASE OF CANCER OF THE UPPER RECTUM, COLOTOMY, AND SUBSEQUENT ENTERECTOMY.

By Jonathan F. C. H. Macready, F.R.C.S.

The subject of this communication was admitted to hospital on May 24th, 1895, suffering from intestinal obstruction. She was 58 years of age.

Six or seven months previously she had had severe pain over the belly, which was accompanied by vomiting and by two or three days of constipation. The bowels then became loose for several days and the vomiting ceased. She had had four or five attacks of this kind, which had generally kept her in bed for a week or 10 days.

She had had an attack five weeks before admission, when the pain was very severe. No alteration had been observed in the size or shape of the fæces.

On the morning of May 18th, six days before admission, she began to suffer pain in the hypogastrium, which was soon diffused over the abdomen. The bowels acted slightly that morning, but were afterwards resolutely constipated. Vomiting began in the evening of the same day and continued at frequent intervals till admission, when it was fæcaloid, and it was said to have been so for two days. There had been paroxysms of pain in the belly relieved by sedatives. She was retching frequently but there was no hiccough. The abdomen was very much distended, resistant,

and tympanitic. No tumour could be felt, nor was anything discovered by rectal and vaginal examination. Pulse, 120; temperature, 97. Tongue moist, coated with brownish fur. As there was some uncertainty as to the situation of the stricture, the abdomen was opened between the umbilicus and pubes, when a hard ring of new growth—at the junction of the sigmoid flexure and rectum—could be felt and seen just at the upper part of the true pelvis. The growth had not invaded neighbouring parts of the bowel, and though provided with a fair mesentery, could not be drawn into the left iliac fossa. Mr. Macready closed the abdominal incision and performed left inguinal colotomy. In view of the severe symptoms of obstruction, the sigmoid loop was sutured to the edges of the wound and opened at once by a simple longitudinal incision.

The bowels acted freely each day during the ensuing week but she was very ill notwithstanding, being much depressed and suffering from cough, with difficulty in breathing. Pulse rapid, and countenance pale, ash-coloured. At length, on May 31st, the abdominal distension subsided and she began to mend. On June 6th the laparotomy wound was nearly healed, and on June 16th she was free from discomfort.

Four weeks after the first operation Mr. Macready proceeded to remove the cancerous mass by median laparotomy. The disease formed a thick band at the junction of the sigmoid and rectum. It was not necessary to use clamps, as the bowel was empty.

The carcinoma appeared to be limited at the one site, but on cutting through the bowel above the growth a flattened band of tissue was seen, extending upwards along the mesenteric border, accompanying and closely resembling the hypertrophied band of longitudinal muscular fibres. It was necessary to cut through the bowel twice again to make sure of getting beyond this process of the disease. The mesenteric vessels were tied and gave no trouble. The rectum was then cut through below the disease and the vessels in its wall were tied with fine silk.

The mesentery, which was thick and very fat, was sutured first on one side and then on the other. The cut ends of intestine were then united, the mucous membrane by interrupted silk sutures and the outer layers by numerous Lembert sutures. As this part of the bowel had been made safe by colotomy from the intrusion of fæces, it was not necessary to make the union very accurate, nor would

this have been at all points possible as the work had to be done rather low down in the pelvis. The operation was then concluded.

The pathologist's report on the growth is as follows:—"The section taken from the diseased part of the rectum shows a typical, cylindrical-celled epithelioma, extensively invading the muscular coat, but the mucous membrane and the submucous tissue are healthy at the spot examined. A second section made at the upper limit of the part removed is quite free from growth. The mucous membrane here is œdematous, and the muscular coat appears hypertrophied, in other respects the tissues are normal."

A week after the enterectomy, Mr. Macready wished to ascertain if the union was good, and he directed the house officer to insert a tube into the anus, and to send a gentle stream of warm water down the bowel from the colotomy opening. These directions were misunderstood, so that the tube was not inserted in the rectum, and warm solution of Condy's fluid, instead of water, was injected into the bowel from above. This was immediately followed by severe abdominal pain. In the afternoon, when he saw her, the pain was still present, and there was some tenderness over the lower abdomen, but as it was not spreading he ventured to temporise and the danger passed off. He subsequently used Mr. Mitchell Banks's india-rubber tube in the colotomy openings, to make sure that the gut below was free, and, whilst the tube was in position, the bowels acted well several times *per vias naturales*.

On July 17th, *i.e.*, 26 days after the last operation, he closed the artificial anus. The bowel was freed from its attachments, brought out, and the longitudinal opening in it was closed with a double row of silk sutures. The gut was then dropped back, and the abdominal opening sewn with a continuous suture. She made a good recovery, and left hospital on August 14th, 1895, four weeks after the last operation. The bowels have since acted naturally. Two operations were performed owing to the experience of several surgeons who, after re-union of parts of the rectum without previous colotomy, have lost their patients from the bursting of the stitches by the descent of fæces.

Mr. Herbert Allingham referred to a paper which he had read not long since at this Society, in which he had insisted on the fact that the resection of growths, when the intestine was distended, almost always led to a fatal result. Indeed, the four cases in which he had operated

with a distended intestine had all ended fatally, while the four cases in which he had relieved the distension by a preliminary colotomy had all recovered.

Mr. Swinford Edwards agreed that this was the proper course to pursue, but pointed out that when median laparotomy was performed, and a colotomy wound was present, as in the author's case, special precautions would have to be taken to prevent fouling of the abdominal wound.

THREE CASES (A BROTHER AND TWO SISTERS) OF HEREDITARY CONGENITAL NYSTAGMUS.

By T. Outterson Wood, M.D.

I have the pleasure of bringing before the Society an interesting set of cases, which are by no means common. They are three cases of hereditary congenital nystagmus occurring in the same family, viz., a brother and two sisters. The cases are hereditary, inasmuch as the father's mother is stated to have had large prominent eyes, which were always "on the work," and they are congenital, because they have always had this movement. The father and mother are healthy people, were no relation to each other, and as far as can be ascertained, both came of a healthy stock, free from nervous affections. There are four members of this family, two brothers and two sisters. Three of them you will see to-night, the other brother, aged 30, has prominent eyes, grey irides, no sight defect, and his eyes are quite steady.

Case 1.

Mrs. K., the elder sister, is 26 years of age, married, and has one child, a boy, about 3 years old, perfectly healthy, well-grown, and free from nystagmus. She came in the first instance as an out-patient at the West End Hospital for Nervous Diseases, seeking advice for nervous depression connected with horrible thoughts of self-destruction, and injury to others, supposed to have been brought on by reading sensational literature. She is now better. On observing the nystagmus, it was thought it might be a symptom of some new disease, her eyesight was very good, and she said that she had had the movement all her life, and that her sister, and she believed her two brothers, had it also. The pupils were equal, acted well to light and accommodation, and there were no fundus changes. Mr. Work Dodd has most carefully investigated the refraction for me, and finds that she has some myopic astigmatism.

Case 2.

Mrs. G., the second sister, is also a healthy woman, aged 25, and has been married some months; she complains of nothing. She has had nystagmus all her life, and I have a suspicion I can at times observe a tendency to movement of the head, but I cannot say yet with certainty it is so. Her sight is good, but Mr. Dodd says she has hypermetropic astigmatism.

Case 3.

Mr. H. is engaged as a paper distributor with his brother, he is 15 years of age, and has nystagmus, but in a less degree than his sisters. He says he has nothing the matter with him. He makes no complaint of his sight beyond that when asked he says he can see better with one eye than the other. Mr. Dodd has found he has hypermetropic astigmatism of the right and mixed astigmatism of the left. The literature of hereditary congenital nystagmus is very scanty. At the annual meeting of the British Medical Association, held in London last July, Dr. Angus McGillivray, ophthalmic surgeon to the Dundee Royal Infirmary, read a most interesting paper, entitled "Hereditary Congenital Nystagmus associated with Head Movements," in which he gives an account of two families in which nystagmus occurred. After skipping a generation it came out in three cases in the second generation and three in the third. In the second group there were four members of a family of nine who had nystagmus, the others being free from it. Dr. McGillivray also mentions that his colleague, Dr. Mackie Whyte, had under his care five cases of nystagmus in one family and refers also to a paper by Mr. Lloyd Owen in the 'Ophthalmic Review' for 1882, where nine cases are noted in four generations.

TREATMENT OF POTT'S FRACTURE BY EARLY STRAPPING, EARLY MOVEMENT, AND MASSAGE.

By Noble Smith, F.R.C.S. Edin.

On November 13th, 1895, I fell and fractured the tibia and fibula of the leg a little above the internal malleolus of the tibia, and the fibula just below its centre, and probably also at its lower

extremity. The foot was turned completely outwards, the fragment, including the internal malleolus, being separated from the shaft by over an inch.

The fracture was reduced immediately, and strapping applied to the foot and ankle within half an hour of the accident, and before any appreciable swelling had occurred.

The strapping was just laid on without any attempt to produce pressure, and was re-adjusted almost daily in accordance with the increase of tension, which, however, was very slight. The strapping was discarded on the seventh day.

The ordinary back-splint, supporting the leg, thigh, and foot, with side-pieces, was applied from the first.

At the end of a fortnight plaster of Paris splints, one on each side, were substituted for the wooden side-splints.

Early Movement.—Very gentle movement of the ankle-joint was kept up almost from the first. Massage was begun slightly during the first week, and gradually increased in extent until the end of the third week, when the side-splints were taken down, one at a time, twice a day for regular massage, care always being taken to avoid disturbance of the fractured bones.

Results.—Movement and massage caused no pain. The latter was especially comforting. On the twenty-first day I could bear the weight of my body on the foot of the injured leg for a moment.

Twenty-third day.—Could walk with caution, resting after each step. Felt no difficulty except weakness in joint.

Thirty-second day.—Could flex and extend foot to one-third of an inch of the sound one. Measurement round ankle only three-eighths of an inch more than the sound one.

Thirty-fourth day.—Gave up crutches, walking easily with two sticks. Also dispensed with splints during day.

Thirty-fifth day (end of fifth week).—Gave up splints entirely.

Thirty-eighth day (five weeks and three days).—Rode a horse in Rotten Row. Had short gallop. No difficulty except from weakness of thigh muscles. Next day rode again, and galloped three-quarters of the length of the Row and back.

Forty-second day (sixth week).—Walked two miles with sticks. A little tired, but with no increase of swelling of leg.

Six weeks and two days.—Hunted on a young, high-couraged horse, but did not jump.

End of seventh week.—Rode eight miles across country.

A CASE OF RESTORATION OF THE GREATER PORTION OF THE OS CALCIS,

In which chips of Decalcified Bone were used to fill up the gap left by the removal of the carious portion of the Bone.

By Herbert F. Waterhouse, M.D., C.M. Edin., F.R.C.S. Eng.

Mabel A., aged 7, was admitted into the Victoria Hospital on May 3rd, 1894, suffering from tubercular disease of the left os calcis and tubercular teno-synovitis of the peronei tendons.

There was a strong family history of tuberculosis, father, two uncles, an aunt, a grandparent, and two cousins having died from tubercular disease in various forms. One child of the same family (brother) died of tubercular meningitis.

The history given was that four months before admission, the child began to walk on tiptoe and refused to put the heel to the ground. She complained of some pain in the heel, which was considerably swollen. Six weeks before admission the child ceased to be able to get about owing to weakness and pain in the heel. On admission into the hospital there was found to be much swelling about the left os calcis, especially on the outer aspect, where fluctuation was distinctly to be made out. Pressure on the os calcis, in any part, gave much pain. The outline of the ankle was distinct on the anterior and internal aspects, but quite lost on the outer side owing to the swelling there present. Movements of the ankle-joint were painless. The head of the astragalus was felt distinctly, and no pain was elicited by pressure upon this bone. The foot could not be dorsi-flexed more than to a right angle owing to tenseness of the calf muscles and pain in the heel.

The case was diagnosed as one of tubercular disease of the os calcis, with abscess formation and involvement of the tendon sheaths of the two peronei muscles. With rest the swelling diminished but little, and as the skin over the outer surface of the os calcis became reddened operative interference became urgent. It was considered that the disease involved no other bone than the os calcis, and that therefore it was worth while making an attempt to remove the disease locally, and to fill up the necessarily resulting gap by means of decalcified bone chips after Senn's method. On May 21st having rendered the

limb bloodless by Esmarch's bandage, I made a curved incision 4 inches long, with its convexity downwards, over the outer surface of the os calcis. The sheaths of the peroneus longus and brevis were found extensively infiltrated with granulation tissue. All this diseased tissue was dissected away and the tendons carefully cleaned. Some broken-down puriform tubercular *débris* having been washed away, the outer surface of the os calcis was found to have been eaten away by the disease. All the soft granulations were now thoroughly removed from the os calcis by means of a small, sharp spoon, and when all the diseased portions of the bone had been scraped away, it was found that merely a thin shell of bone remained. The whole interior of the bone, and the whole of its outer wall, were cleared away, and the os calcis was represented merely by a cavity whose anterior, posterior, internal, and superior walls were formed of a thin shell of compact bone, and whose external wall was entirely absent, whilst the inferior was incomplete, having two large perforations in it. This cavity was thoroughly douched with a 1 to 20 solution of carbolic acid, and then carefully and tightly stuffed with minute fragments of decalcified bone taken out of an alcoholic solution of carbolic acid and mixed into a paste with iodoform. The wound was then sutured with catgut stitches. A large cyanide dressing was applied, and over this an elastic bandage. No vessel was ligatured, as the Esmarch's bandage was not removed until the dressing with its elastic bandage had been applied. For the first 24 hours the foot was elevated and the elastic pressure kept up. There was no pain, and the highest temperature noted was 100°·2.

The wound was dressed for the first time on June 14th, and was found healed, except that a small portion of the skin margin had sloughed. On the front of the foot, however, there were somewhat extensive sloughs of the skin. These were, however, quite aseptic, and there was no rise of temperature. The foot was now dressed twice weekly, and the sloughs readily separated; the wounds healed quickly, and the child was dismissed with the foot in a plaster of Paris case in July, 1894. By this time everything was soundly healed, though the scars on the dorsum of the foot had somewhat of a keloid appearance.

The child remained in perfect health, and was able to walk about as well on the left leg as on the right. Eight months later, however, an abscess, proved by inoculation to be tubercular,

occurred in the popliteal glands of the same leg. This was opened, and healed somewhat slowly but thoroughly. Since this time the child has been in excellent health, and has, as may be seen, as normal a foot on the left side as on the right.

The chips of bone were taken from the scapula of a lamb after the shoulder of lamb had served for the dinner of the resident medical officers. It was decalcified by a 15 per cent. solution of hydrochloric acid, cut up into fragments, and then washed in ether to remove the fat; next it was placed in a solution 1 to 10 of carbolic acid in glycerin for several days; after this the fragments were placed for 24 hours prior to the operation in an alcoholic solution of carbolic acid. I have employed this method for filling up cavities left by the removal of carious portions of bone in seven other cases, and have had occasion to be extremely well satisfied with it. In no case has any particle become expelled. As regards the action of these chips of decalcified bone, I share the belief that they serve merely as a temporary scaffolding for the growth of new bone; they are, of course, absorbed in time and replaced by new-formed bone. They have over blood-clot the double advantage that they do not contract, and that they do not form a pabulum for micro-organisms, being, on the contrary, charged with an antiseptic. The sloughing of the skin was a regretable occurrence. I fear it was due to a combination of causes—the Esmarch ischæmia, the elastic bandage which was kept on for 24 hours after the operation, the employment, in error, of a 1 to 20 solution of carbolic acid in which to soak the dressing applied to the wound in place of a 1 to 60, as I now always use in children after the Esmarch bandage. This sloughing, however, had no ill effect on the os calcis, as, fortunately, asepsis was maintained throughout.

TWO CASES.

By Alfred Eddowes, M.D.

(1) Favus of Scalp and Nails.

When the case came under his care there was a total absence of mousey odour and the characteristic cups of favus. The crust upon the scalp had an appearance often seen in cases of seborrhœa.

Under the microscope, however, mycelium was found in large quantity.

(2) Scrofuloderma of the Face.

An extensive and chronic case of scrofuderma affecting right eyelid, cheeks, the right ear, the front and sides of neck, as well as the upper part of thorax. The undermined skin had healed quickly under drainage with cotton wool carrying calomel, and a covering of Unna's hydrarg-carbol plaster.

April 13th, 1896.

THREE CASES.

By F. de Havilland Hall, M.D., F.R.C.P.

(1) Osteitis Deformans.

R. T. M., aged 48, an oilman, was admitted into the Westminster Hospital under my care on March 6th, 1896. Patient first noticed that his left leg was getting larger about seven years ago, has noticed increasing size of the head for about two years. He had not recognised that the right leg was enlarged. As will be seen, the head is more enlarged on the right side than the left, this is especially noticeable in the bi-parietal diameter. From glabella to most prominent part at back of head—right side, 13 inches; left side, 12 inches; greatest circumference, 25¼ inches. The face is not enlarged, except that the lower maxilla is slightly thickened. The left leg is very much thickened and is curved with the convexity forward and outward, the increase in size is most noticeable in the tibia, though the femur is also thickened. The right leg is less deformed than the left. The ilia are somewhat thickened. The legs are covered with varicose veins. There is thickening of the right clavicle. The humeri are beginning to be affected, and the left radius is thickened. Angular curvature is marked in the lower dorsal region. Previous health, good. The patient has not had syphilis, and there is no history of rhematism or gout. On admission he complained much of pains in the bones. For some days he was kept in bed, but had no medicine, and the pains continued. He was then ordered a mixture containing 2 grains

of quinine and 5 grains of iodide of potassium, and in the course of a week he entirely lost his pains and left the hospital much improved in health.

On three previous occasions cases of osteitis deformans have been exhibited before the Society. Mr. Walsham showed one in November, 1882 (vol. vi, p. 297); Dr. G. F. Elliott, in December, 1887 (vol. xi, p. 92); and Dr. Leonard Guthrie, in April, 1894 (vol. xvii, p. 355). In the present case the usual features of the disease are exhibited, viz., that it attacks people of middle life or upwards, that its onset is insidious, its progress slow, and apparently only ceases with life. The skull and long bones, especially those of the lower extremities, are most affected. Curvature of the spine, as met with in this case, is a marked feature. The bones of the face escaped. This patient suffered very much from the pains which are characteristic of the disease, and obtained great relief from the combinations of quinine and iodide of potassium. The varicose condition of the veins over the lower extremities deserves attention. The disease was first described by Sir James Paget in 1877, in vol. lx, 'Med. Chir. Trans.,' and he contributed a further series of cases in vol. lxv.

(2) Tumour of the Liver Associated with Jaundice.

A. G., aged 31, an omnibus driver, was admitted into the Westminster Hospital on January 28th, 1896, and was discharged on March 7th; 39 days in hospital. He stated that he first began to be unwell about a month before admission; illness commenced with vomiting, continued for several days; he then noticed that he was yellow. He was sick occasionally up to two days before admission, but not to the same extent as at first. He had pain in the epigastrium, diarrhœa, and clay-coloured stools. The patient attributed his illness to a chill. With the exception of an attack of pleurisy in October, the patient had previously enjoyed good health, and had led a steady life. On admission the liver dulness extended from the 4th rib down to a finger's breadth below umbilicus; the lower margin of the liver is firm, smooth, and rounded. The liver is painless and not tender. During his stay in the hospital the patient's temperature twice reached 99·6°, it was usually about normal. Pulse infrequent. He had the ordinary symptoms of jaundice, *i.e.*, pale stools, bile-coloured urine and irritable skin. His weight at first increased, but at his

discharge it was the same as on admission. The liver decreased in size and became less firm. On his discharge he was still jaundiced, but the motions were much darker. The most probable explanation of the enlargement of the liver in this case is that he has an hydatid cyst, and inasmuch as the tumour is smaller than it was, it would appear that the cyst is shrinking. Two explanations may be given as to the jaundice: one, that the patient was suffering from gastro-duodenal catarrh with extension up the common duct giving rise to catarrhal icterus. The persistence of the jaundice rather upsets this view. The other hypothesis is to regard this as one of those comparatively rare cases of hydatid cyst in which the tumour presses on the common bile duct. Dr. Hall remembered seeing one case of soft primary cancer of the liver in which the tumour very much resembled the one present in this case.

(3) Lymphatic Obstruction of the Left Lower Extremity.

Bessie P., aged 25, single, a teacher, was admitted into the Westminster Hospital on November 5th, 1894.

The patient stated that about four years previously she noticed that her left foot was swollen, there was no pain, and at the time she was staying at a farmhouse in the country, and was particularly healthy. The swelling gradually extended up the leg to the thigh. The enlargement of the leg has not affected the patient's general health, and she is able to walk about, but the leg feels heavy and hot in the evening after any exertion. The patient has never lived out of England, and she has an excellent family history.

On her admission, in November, 1894, there was an erythematous blush over the leg, but this disappeared on keeping the leg up. Inflamed lymphatics, enlarged veins or glands have never been noticed.

	Nov. 16th, 1894.	Dec. 20th, 1894.
Over dorsum of foot ..	$10\frac{1}{2}$ inches	$8\frac{3}{4}$ inches.
Round calf..	18 ,,	$15\frac{1}{2}$,,
,, thigh	23 ,,	$19\frac{3}{4}$,,

Treatment.—Rest; perforated rubber bandage; Syr. Ferri. Iod. 3i, Potass. Iod. gr. v, t. d.

Present Measurements.

	Left.	Right.
Dorsum of foot	11 inches	$9\frac{1}{4}$ inches.
Middle of calf	$20\frac{1}{2}$,,	$13\frac{1}{4}$,,
Round knee	$18\frac{3}{4}$,,	14 ,,
Middle of thigh	26 ,,	$18\frac{3}{4}$,,

As will be seen, the left leg is of an enormous size, it does not pit on pressure, and the skin is of normal colour. Short, stumpy hairs are present on inner side of leg below knee. Dr. Hall believed the condition was allied to elephantiasis, *i.e.*, that there is some block in the lymphatic system of the left lower extremity, and that the block now extends up to the pelvis.

Mr. Clutton observed that in all the cases of lymphatic obstruction, in association with filaria or otherwise, he had seen, there had always been some vesiculation of the surface with the formation of bullæ, and a warty condition of the skin over the malleoli, followed sooner or later by a discharge of lymph. He said he had seen a fair number of such cases in this country of lymphatic obstruction, but he had failed to find any possible source of obstruction in the pelvis. He added that when this condition supervened in young subjects it was usually followed by an increase of nutrition, resulting in increased length of the affected limb. The increase in a case of his, at present under observation, was as much as 2 inches, and he asked what was the patient's condition in this respect.

Mr. Waterhouse said he had a precisely similar case under his care during the last few months, in fact when he saw the leg he thought it was the same patient. She was a young woman 18 years of age. She had been examined under an anæsthetic, but, in spite of the most careful search of the pelvis, abdomen, rectum, &c., no tumour had been discovered. The limb had been punctured on three or four occasions, and had yielded fluid, giving the ordinary reactions of lymph. The use of a Martin's bandage had been followed by steady diminution in the size of the limb. The patient was a Jewess who had never been out of England.

Mr. G. R. Turner asked if anything had been noted pointing to the existence of chyluria. He himself had seen a similar case in association with chyluria, and also in association with a discharging sinus of the groin.

Dr. Hall, in reply, said there had never been any escape of lymph from the leg. When first admitted the leg was somewhat erythematous. The urine had been repeatedly examined, but was always normal. Apart from being somewhat anæmic, her general health had always been good.

CASE OF CONGENITAL DISTENSILE TUMOUR OF THE NECK.

By Edmund Cautley, M.D.

C. B., male, aged $5\frac{1}{2}$ months. The swelling was first noticed at the age of five weeks. It is situated entirely subcutaneously in the left cervical region, mainly behind the posterior border of the sterno-mastoid muscle, but extending under the muscle and visible in front of the lower half of the anterior border. It varies considerably in size, being largest and most prominent when the child's head is turned to the left and while it is crying. Under these conditions it attains the size of a Tangerine orange, somewhat elongated and compressed by the muscle. When distended it is somewhat dusky in colour, soft to the touch, dull on percussion, and does not pulsate. From the colour, the distension on crying, and the absence of resonance, Dr. Cautley regarded the swelling as a venous angeioma. Other possible diagnoses are lymphangeioma and hygroma of the neck.

Mr. Battle asked whether there was dulness over the upper part of the chest, and also whether the tumour was translucent.

Dr. Cautley, in reply, said there was no dulness over any part of the pulmonary area. The tumour became more dusky the more it swelled up and was not translucent. The spine was normal. In other respects the child appeared to be quite healthy. The swelling was dull on percussion, and this fact negatived the possibility of its being a pneumatocele. No respiratory sounds were heard over it.

TWO CASES.

By William H. Battle, F.R.C.S.

(1) Lateral Spinal Meningocele.

The patient was an ill-developed infant, aged $2\frac{1}{2}$ months, who presented a congenital fluid swelling of the size of a goose's egg to the left of the upper part of the sacrum; the swelling presented alterations of tenseness when the child cried, and it could be partly reduced on pressure, but the skin covering it was quite normal. A distinct deficiency could be felt between the posterior superior spine and the spine of the sacrum, and the former was further away from the middle line than normal, being evidently displaced outwards.

(2) Result of Operation in a Case of Spontaneous Dislocation of the Patella.

The patient, a girl, 14 years, was admitted to hospital in December, 1895, complaining of inability to walk far, and a tendency to fall at times. The patella was found to have become dislocated on to the outer condyle of the femur, and on flexion to a right angle it slipped completely out of the intercondyloid groove. The quadriceps extensor was wasted, and this wasting was more marked on the inner side of the thigh. The external condyle was apparently ill-developed. Improvement followed osteotomy after Macewen's plan, but there was still a tendency to displacement outwards when the limb was fully flexed. This might probably be overcome by the use of special apparatus.

TWO CASES.

By Clinton T. Dent, F.R.C.S.

(1) Hairy Mole of Face.

The patient was a boy aged 12, and the mole had been treated by repeated shaving down to nearly the whole thickness of the cutis in order to get beneath the pigmentary layer. This shaving had produced a keloid condition, and Mr. Dent proposed to remove the whole growth by dissection and to skin-graft. It was remarkable that under the repeated shavings the hairs had become nearly white.

Mr. G. R. Turner said he had seen the case from the beginning, and he congratulated the author upon the improvement that had taken place, especially in respect of the pigmentation. He questioned whether the lad would not do well to put up with his hairy mole, especially as the disfigurement would be masked to some extent when the beard grew. If an attempt were made to remedy the condition by skin grafting there was a risk of producing ectropion.

Mr. Clinton Dent, in reply, said the hairs originally showed as black points, but of late they had lost their pigment.

(2) Sarcoma of the Rectus Abdominis Muscle.

The patient, a woman aged 23 years, ascribed the origin of the tumour to an accident which occurred to her in February, 1895.

The tumour was originally limited to the upper part of the rectus, and a smaller nodule was noticed about the level of the umbilicus, and was removed at Guy's Hospital, in September, 1895. The tumour appeared to be situated within the sheath of the rectus, and had at first diminished under the use of iodide of potassium, but this treatment had not been persevered with. Of late the tumour had increased rapidly and nodules were to be felt in the abdominal wall near the right iliac fossa and deeper (?) in the pelvic cellular tissue.

CASE OF TUMOUR OF THE NECK. ? CONGENITAL DEFORMITY OF RIBS.

By George R. Turner, F.R.C.S.

The patient was a girl aged 16 years, who had only noticed the swelling of the neck for the previous nine months; it had increased but slightly since November last. The swelling gave no trouble, except for numbness down the left arm. There was a grating sensation on elevating the shoulder and moving the scapula over the swelling. The swelling did not move with the scapula, and was apparently connected with the vertebral end of the ribs. There was no lateral curvature. The patient's mother had had for a long time a bony swelling on the right side of the neck just behind the brachial plexus.

Mr. Clinton Dent said he had seen cases practically identical with this one. He inclined to the view that it was probably a deformity, and not of the nature of a tumour, though there might possibly be some over-growth of the ribs at their vertebral extremities which displaced the scapula. He had watched the case for the last six months, and though the girl had grown considerably, and the deformity, in consequence, had become more evident, there was no such difference in the swelling as might have been expected had it been of the nature of a tumour. There was nothing extraordinary in the fact that the patient's mother presented a similar conformation, and possibly if other members of the family were examined the same thing would be found to exist. The fact that it had only been noticed so recently need not cause surprise, for persons of this class were singularly unobservant.

CASE OF CANCER OF LARYNX.

By T. Gilbart Smith, M.D., F.R.C.P.

Dr. Gilbart Smith showed a specimen removed *post-mortem* from a patient, aged 58, a man, who came to the Chest Hospital with a history of having been perfectly well until six months previously, when he had begun to suffer from his throat. On examining the throat the epiglottis was seen to be considerably swollen, enlarged, and curled, and the right ary-epiglottic fold was also swollen. It was impossible to obtain a view of the vocal cords owing to the entrance into the larynx being blocked by two or three excrescences from the base of the epiglottis. In spite of the size of the growths the man never suffered from dyspnœa until the day before his death. Latterly there had been a difficulty in swallowing, but for a long time this symptom was absent. The night before he died he had a sudden attack of dyspnœa. Tracheotomy was done under chloroform and the man died a few hours later apparently from simple heart failure. *Post-mortem*, it could be seen that the disease commenced in the epiglottis, and had spread downwards along the right arytenoid fold, not, however, invading the larynx. He thought the man would have lived longer if the tracheotomy had been done without an anæsthetic.

Dr. de Havilland Hall said the case was only another example how a gradually increasing obstruction of respiration could be borne until the amount of air which found its way into the lungs was extremely small. Only last week he had seen, in consultation, an elderly lady, in whom a huge malignant mass springing from the cricoid cartilage completely obstructed the entrance of the larynx, yet until the night before he had seen her, breathing had been comparatively easy. On examining the condition with the laryngoscope one could not but be surprised that she should have been able to breathe at all. The air must have entered the lungs by the side of the mass, yet she had been going on for months without acute dyspnœa. The same amount of stenosis coming on rapidly would have proved immediately fatal. He asked what were the microscopical appearances.

Dr. Gilbart Smith replied that it proved to be an epithelioma.

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